DOCUMENT RESUME

ED 080 897 CE 000 117

AUTHOR	Harris, George W.; O'Fallon, O. Kenneth
TITLE	Cost Analysis of Secondary School Vocational Technical Education Programs.
INSTITUTION	Tennessee Research Coordinating Unit for Vocational Education, Knoxville.; Tennessee Univ., Knoxville. Bureau of Educational Research and Service.
PUB DATE	Jun 73
NOTE	114p.
EDRS PRICE	MF-$0.65 HC-$6.58
DESCRIPTORS	*Cost Effectiveness; Program Costs; Secondary Education; *Technical Education; *Unit Costs; *Vocational Education
IDENTIFIERS	*Tennessee

ABSTRACT

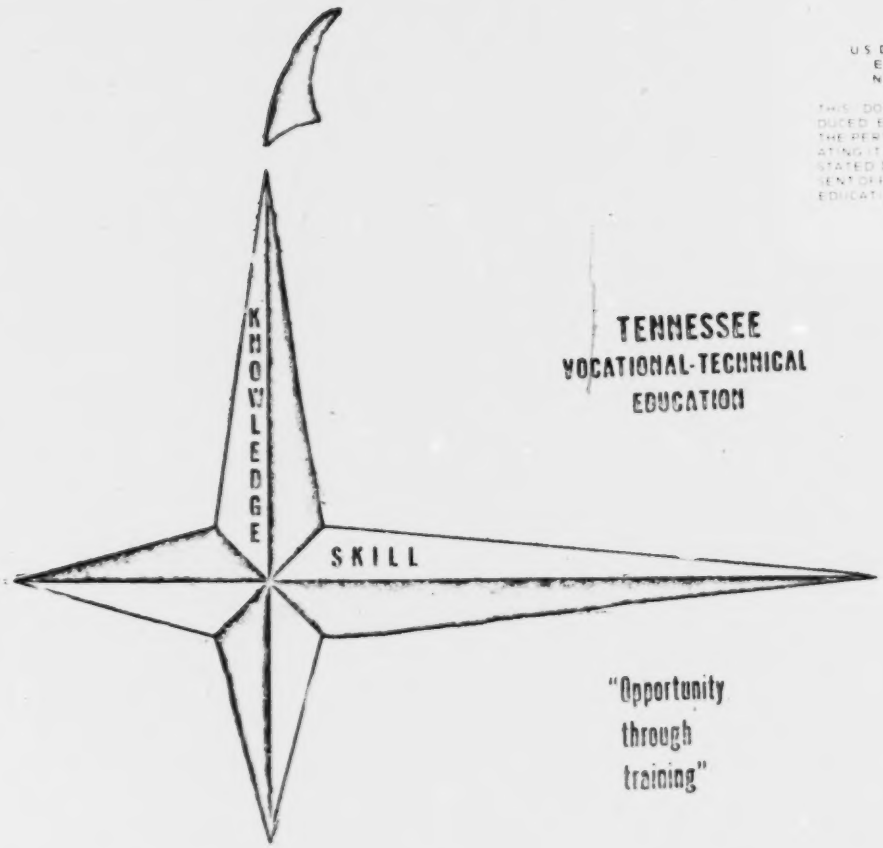
Delivery costs per contact hour for secondary school vocational technical education in Tennessee were gathered from January to June 1973. A sample of six selected schools teaching 58 courses in 109 separate classes was used. Data were analyzed to determine direct and indirect costs per student contact hour for each course with and without consideration of site value, total cost per student contact hour per course, total cost of educating a student in each course, and projections of course and program costs for a five year period. Results are presented in tables and text. There was no evidence that size of school or geographical location was important in determining the cost level. Teachers' salaries were found to be the largest direct cost. Cost factors and projected costs reported in this study can be useful for planning and budgetmaking. Three additional studies are recommended. Terms are defined and forms used are given in appendixes. (MS)

FILMED FROM BEST AVAILABLE CO

ED 080897

COST ANALYSIS of SECONDARY SCHOOL VOCATIONAL-TECHNICAL EDUCATION PROGRAMS

U S DEPARTMENT OF HEALTH
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION
THIS DOCUMENT HAS BEEN REPRO-
DUCED EXACTLY AS RECEIVED FROM
THE PERSON OR ORGANIZATION ORIGIN-
ATING IT. POINTS OF VIEW OR OPINIONS
STATED DO NOT NECESSARILY REPRE-
SENT OFFICIAL NATIONAL INSTITUTE OF
EDUCATION POSITION OR POLICY



TENNESSEE
VOCATIONAL-TECHNICAL
EDUCATION

"Opportunity
through
training"

Tennessee State Board for Vocational Education
Benjamin E. Carmichael, Executive Officer
Nashville 37219

1973

CE 000 117

FILMED FROM BEST AVAILABLE CO

The study was developed by and completed under the direction of the Bureau of Educational Research and Service, College of Education, University of Tennessee, Knoxville, Tennessee, 37916.

ED 080897

COST ANALYSIS
OF
SECONDARY SCHOOL VOCATIONAL-TECHNICAL EDUCATION PROGRAMS

Prepared by

Dr. George W. Harris, Jr., Co-Director
Dr. O. Kenneth O'Fallon, Co-Director

Jerry M. Kondwros, Graduate Assistant
Elma H. Mardis, Graduate Assistant
Arnett G. Montague, Graduate Assistant
Keith A. Nicholson, Graduate Assistant

for

Tennessee Research Coordinating Unit for Vocational Education
State Department of Education
Division of Vocational-Technical Education
and
College of Education
The University of Tennessee

June, 1973

PREFACE

This report is based on original data compiled for a study developed by the Bureau of Educational Research and Service and by the Department of Educational Administration and Supervision of the College of Education, University of Tennessee, Knoxville through the Tennessee Research Coordinating Unit for Vocational Education. Data were collected by the researchers from records made available in the schools and school district central offices. Analyses of data followed the basic pattern described in the approved proposal. It is anticipated that the organization and presentation of the information developed by the study will provide a usable base for planning and projecting costs of operating programs and probable budget requirements for new programs. Elements of high cost can also be identified as well as the influence of salaries, administration, etc. on total cost of each program area and some specific courses.

TABLE OF CONTENTS

	Page
PREFACE	ii
LIST OF TABLES	v
INTRODUCTION	1
PROBLEM	2
PURPOSE AND OBJECTIVES	2
SIGNIFICANCE OF THE STUDY	3
LIMITATIONS OF THE STUDY	4
DELIMITATIONS OF THE STUDY	4
DEFINITION OF TERMS	4
SELECTION OF SAMPLE	5
METHODS AND PROCEDURES	6
THE STUDY	8
STUDY FINDINGS	10
Summary of Courses and Costs	10
Cost Comparisons	15
Direct Costs	20
Cost Projections	33
Program Costs Projected	37
SUMMARY AND CONCLUSIONS	37
Summary	37
Conclusions	40
RECOMMENDATION	41

Page

APPENDICES 43

Appendix A 43

DIRECT COSTS 44

INDIRECT COSTS 45

Appendix B 48

U.S.O.E. CODE NUMBERS FOR IDENTIFICATION AND CLASSIFICATION OF VOCATIONAL COURSE OFFERINGS 49

Appendix C 57

DISTRICT LEVEL: Personnel/Enrollment Data -- Building & Site/Cost and Size 58

BUILDING LEVEL DATA FORM: OPERATIONS 59

VOCATIONAL COST ANALYSIS BREAKOUT CHART: SECTION I; Administration (2100) -- Operation of Plant (2600) . 62

VOCATIONAL COST ANALYSIS BREAKOUT CHART: SECTION II; Maintenance of Plant (2700) -- Clearing Accounts (4100) 72

Appendix D 83

ALTERED FORMAT FOR PREPARATION OF COMPUTER ANALYSIS . 84

VOCATIONAL COST ANALYSIS BREAKOUT CHART: SECTION I; Administration (2100) -- Operation of Plant (2600) . 88

LIST OF TABLES

Table		Page
I.	SUMMARY OF COURSES AND COSTS IN THE SAMPLE SCHOOLS; PER PUPIL PER CONTACT HOUR	11
II.	COST COMPARISON CHART FOR DELIVERY OF VOCATIONAL-TECHNICAL EDUCATION; PER PUPIL PER CONTACT HOUR	16
III.	COST OF VOCATIONAL PROGRAMS PER STUDENT CONTACT HOUR . . .	21
IV.	PROGRAM COST PROJECTIONS; PROJECTED COST BASED ON CURRENT ENROLLMENT	35
V.	PROGRAM COST PROJECTIONS BY SCHOOL BASED ON CURRENT AND MAXIMUM ENROLLMENTS	38

INTRODUCTION

Recently there has been a phenomenal development and growth in the area of vocational-technical education because of the growing recognition to develop manpower training programs to meet the expanding needs of business and industry in the United States. Thus, an increasing percentage of the nation's high school students, older youth, and adults who may not have completed high school are expected to enter these institutions in the future. Also, there are many high school students with the ability to gain entry into higher education areas who are turning toward vocational education because of real or imagined surplus conditions in certain professions (e.g., teaching and engineering). The important function of these institutions is to provide vocational-technical programs leading directly to employment. With this advent of unprecedented expansion in training program offerings, attention was directed toward the specific costs of vocational-technical training programs. The development of a research project was indicated.

The Cost Analysis Study of Secondary School Vocational-Technical Education Programs was initiated by the Bureau of Educational Research and Service of the University of Tennessee, Knoxville; it extended over a period of six months (January 1 to June 30, 1973). This report is based on data and information retrieved from the research project. The resultant findings should not be construed as definite and exacting, but recognized as indicators of delivery cost per contact hour for secondary school vocational-technical education in the State of Tennessee.

PROBLEM

One of the primary needs in the Tennessee public school system is to determine present operational costs of vocational-technical education programs on a per pupil basis. Another problem confronting vocational-technical education planners is projecting program costs. The present system of accounting being used by school districts lacks the following:

1) specific detailed costs by course offering;
2) the department and number of students for which the expenditures were incurred.

Analysis of costs took place at an operational level where inference was made from on-going data. The analysis of available data was used to ascertain the unit cost of each vocational-technical program course or category. In addition, an analysis of each factor that contributed to this cost was made to determine relationships that might exist.

PURPOSE AND OBJECTIVES

The purpose of this study was to conduct a microanalysis of costs of vocational-technical programs in selected high schools in the State of Tennessee. Specifically, the purpose was to analyze a sample of present courses in vocational-technical education programs and to determine what the per pupil contact hour cost was for vocational-technical programs in the State of Tennessee. Specific objectives of the project were:

1) To determine the per pupil contact hour cost for each vocational-

technical program category or course found within the selected sample.

2) To compute the existing or current cost of a vocational-technical program.

3) To provide long-range costs for program courses and categories.

SIGNIFICANCE OF THE STUDY

The findings of this study are expected to improve educational planning in the State of Tennessee by establishing a cost index per program course or category. This index should provide a basis for decisions regarding allocation of time, money, and other scarce resources pertinent to the operation of vocational-technical programs. Furthermore, this microanalysis study will furnish meaningful data to initiate cost/effectiveness analyses for all vocational-technical programs. Hence, the educational planner will have a set of new quantitatively-oriented alternatives for effective futuristic decision making.

The rationale underlying the microanalysis of costs in this study is expressed in the following basic assumption: Current unit cost per student contact hour for a particular program course or category depends upon the factors of enrollment, direct program costs (i.e., teacher salaries, supplies, equipment, space), indirect ancillary services (i.e., administrative costs, operation and maintenance of plant, non-instructional supplies, debt service, fixed charges), and other indirect costs.

LIMITATIONS OF THE STUDY

The limitations inherent within this study were the sample size or population used and the length of time available to complete the study.

DELIMITATIONS OF THE STUDY

This microanalysis study focused on monitoring time and cost of the various activities associated with each vocational-technical course and program category within a selected sample of six schools.

DEFINITION OF TERMS

1. Direct Costs - are those costs which contributed directly to a specific program course or category and include the following basic areas of expenditures: teacher salaries, equipment, materials, and space. (For completed definition and procedure for allocation see Appendix A.)
2. Indirect Costs - all expenditures which relate indirectly to the operation of vocational-technical education within the total educational enterprise. These expenditures represent ancillary services, administrative services, fixed charges, debt services and other expenditures necessary for the total operation of school systems. (See Appendix A for complete categorization of indirect costs.)
3. Mean - cost that results by dividing total sample student contact hours into the sum of the total sample costs. At times the mean may be reflected as the composite of similar program categories and at

other times may reflect only a single course.

4. Program Category - two or more similar vocational-technical program courses as defined in Appendix B of U.S.O.E. vocational classification.

SELECTION OF SAMPLE

The sample population of the project was comprised of six selected secondary schools located in the State of Tennessee. The research team selected the sample from the population of existing vocational-technical education programs in Tennessee listed as having one or more vocational-technical courses as part of the curriculum. Other related factors considered in the selection of the schools were: (1) geographic location; (2) type of school (i.e., comprehensive or vocational and/or rural or urban). and (3) the number and variety of vocational-technical course offerings. The major criterion involved selecting the smallest number of schools with the largest cross section of representative vocational-technical course offerings. The following schools were selected for the study:

1) Bradley High School (Cleveland, Tennessee)
2) Johnson City Vocational-Technical School (Johnson City, Tennessee)
3) Kirkman Technical High School (Chattanooga, Tennessee)
4) McGavock High School (Nashville, Tennessee)
5) Northside High School (Memphis, Tennessee)
6) Warren County High School (McMinnville, Tennessee)

METHODS AND PROCEDURES

The research team was comprised of two professors and four graduate assistants from the University of Tennessee, Knoxville. Initially, areas of responsibility for the team members were delineated. Financial data regarding the cost of vocational-technical programs were collected at both the central office and building levels. Other vital information collected (per program course or category) included: number of teachers, complete inventory of equipment and supplies, number of pupils participating in each program course or category, and other pertinent data.

After the sample population was selected it was necessary to develop instruments which could be utilized in the collection of needed data. (See Appendix C). The instruments used were adaptations of Classification of Expenditure Accounts from the handbook of the procedures for Financial Accounting for Local and State School Systems, Handbook II.[1] The research team, with the assistance of school staff personnel, used the instruments to collect, transfer, and organize the data necessary for the study.

The expenditure data were listed in one of four categories: district level, vocational education district level, building level or vocational education building level. This format was dictated by the limited avenues available for data collection. For example, often data on health service expenditures were not available at the building level, and total health service for the entire school system were recorded in the district level column. Once the expenditures were recorded in the appropriate column, prorations of expenditures were calculated on the basis of pupil enrollment figures, such

---

[1]Paul L. Reason and Alpheus L. White, Financial Accounting for Local and State School Systems: Standard Receipt and Expenditure Accounts. Washington, D.C.: United States Government Printing Office, 1957.

as district level enrollment, and vocational education building level enrollment. As far as possible the data were recorded in the column which most nearly indicated the exact location of the expenditures.

After the data were collected from the representative sample, they were prepared for computer analysis; this necessitated the alteration of the original format. (See Appendix D for complete explanation and design of alternate format.)

To determine the cost of educating a student in a specified vocational program, the calculation of current unit cost per student contact hour for each program was accomplished through the following steps:

1) A representative sample was selected from the population.
2) The selected sample of schools with vocational-technical education programs in Tennessee was contacted and permission granted to collect the data necessary for completion of the study.
3) Each selected school was visited to gather the following data:
    a) Name, position and salary of each professional staff member associated with the vocational-technical program.
    b) A class schedule for the current school year amended to provide the name and numbers of each section taught, credit and contact hour for each course, enrollment, and name of instructor.
    c) A copy of the master schedule describing each course and curriculum offered.
    d) A copy of the financial report for the fiscal period covered with all expenditures for current operations allocated to academic departments in so far as the records were available.

e) The number of full-time equivalent students enrolled in each curriculum for the period covered.

4) Analysis of the data was made to determine:

a) Direct costs per student contact hour for each course;

b) Indirect costs per student contact hour for each course <u>without</u> consideration of the value of site or location;

c) Indirect costs per student contact hour for each course <u>with</u> consideration of the value of the site and location;

d) Total cost per student contact hour for each course;

e) Total cost of educating a student in each course offered;

f) Projections of course and program costs in terms of existing and maximum enrollments for a five year period based on an inflationary change factor of five percent.

THE STUDY

It was recognized in the planning stages of the study that comparable and useful data could best be obtained if they were collected in the schools and the school districts by the same individuals, using a set of collection instruments which had been designed to accomplish the transfer of needed information from school records to forms which would make data computer usable. Differences in school district record keeping contributed to the need for such procedure because similar data were available from a variety of sources and were housed at different locations.

Data collection instruments were developed by the researchers. The instruments were pilot tested at the first school. Revision of the instruments was

completed following "first use." Changes were dictated by problems encountered in "first use" and in organizing information for computer utilization. A primary objective for the data collection process was to gather all information that contributed in any way to delivery costs and to the accurate allocation of such costs to the proper program category or vocational course.

Any and all costs which contributed either directly or indirectly to the contact hour delivery cost of each vocational course offered and taught was recorded. Indirect costs were those associated with the school district total operation and thus became constant for all courses identified with a given school. Direct costs varied by specific course within a given school and included costs directly identified with it.

The collected data were banked and the computer was programmed to deliver student contact hour unit costs for the 58 different courses in the six schools. The basic data were analyzed to show high, low and mean cost by course, mean cost by program and cost categories, projected mean cost based on current enrollments and projected mean cost based on capacity enrollments. The data analyses were designed to provide useful comparative and planning information and to minimize distortions associated with extremes at either the high or low ends of the spectrum identified with the collected data.

During the process of establishing pupil costs per contact hour in each of the vocational courses and categories, cost information was collected at both the district level and the local building level. The findings of this study indicate many variations in unit costs among schools represented.

In addition to this type of disparity, important cost variations were found for program courses and categories within each school. The scope of this study was primarily limited to determining contact cost per student for each instructional hour, but in the process of establishing such costs, other cost information such as cost of supplies, equipment, buildings, site, and certain indirect costs were also identified. It is important for planning and development that these incidental costs be given careful consideration.

STUDY FINDINGS

Summary of Courses and Costs

All basic cost data are displayed in Table I. This composite classifies the data by course and breaks it out as direct, indirect and total costs and describes it further by school and school system.

The six schools offered and taught 58 different courses in 109 separate classes. The largest number of classes available in a single school was 26 and the smallest number in a school was found to be 12. No single course was offered in all six schools; however, two courses were found in five of the six schools, four courses in four of the six schools, 11 courses in three of the six schools, nine in two of the six schools, and 32 courses were found to be offered in only one school.

High costs were found to be associated with both course and school. For example, total costs per pupil contact hour of $2.00 or more were found in all but one of the schools and the same level of cost was found for eight different classes. Total costs at the low end (less than $1.00 per pupil

TABLE I

SUMMARY OF COURSES AND COSTS IN THE SAMPLE SCHOOLS; PER PUPIL PER CONTACT HOUR

Course	A Dir. Cost	A Ind. Cost	A Tot.	B Dir. Cost	B Ind. Cost	B Tot.	C Dir. Cost	C Ind. Cost	C Tot.	D Dir. Cost	D Ind. Cost	D Tot.	E Dir. Cost	E Ind. Cost	E Tot.	F Dir. Cost	F Ind. Cost	F Tot.
010101 - Animal Science	.65	.30	.95															
010199 - Agri. Production, Other	.61	.30	.91															
010299 - Agri. Supply/Serv., Other													.47	.28	.75			
010305 - Agri. Mechanics Skills													1.07	.28	1.35			
010504 - Landscapin.	.64	.30	.93															
010599 - Ornament. Hort., Other				1.16	.67	1.83												
010704 - Wood Utilization										.37	.50	.87						
049900 - Distrib. Educ., Other	.90	.30	1.20							.49	.50	.99	1.79	.28	2.07	.51	.31	.82
070302 - Practical (Voc.) Nursing																.65	.31	.96
070399 - Nursing, Other										.94	.50	1.44						
079900 - Health Occup. Educ., Oth.				.57	.67	1.24	.54	.43	.97									
090101 - Comp. Homemaking or H.E.	.49	.30	.79							.22	.50	.73	.51	.28	.79			
090102 - Child Development													.52	.28	.80			
090103 - Clothing and Textiles										1.54	.50	2.05	.65	.28	.93			

TABLE I (continued)

SUMMARY OF COURSES AND COSTS IN THE SAMPLE SCHOOLS; PER PUPIL PER CONTACT HOUR

Course	A Dir. Cost	A Ind. Cost	A Tot.	B Dir. Cost	B Ind. Cost	B Tot.	C Dir. Cost	C Ind. Cost	C Tot.	D Dir. Cost	D Ind. Cost	D Tot.	E Dir. Cost	E Ind. Cost	E Tot.	F Dir. Cost	F Ind. Cost	F Tot.
090107 - Foods & Nutrition										1.51	.50	2.01						
090199 - Homemaking, Other							.67	.43	1.10									
090201 - Care & Guid. of Children				.65	.67	1.32				1.47	.50	1.97				.62	.31	.93
090203 - Food Mgmt., Prod., & Serv.										.74	.50	1.24						
090299 - Occup. Prep., Other				.28	.67	.95												
140102 - Bookkeepers				.61	.67	1.27										.81	.31	1.12
140203 - Programmers				.34	.67	1.01												
140303 - Gen. Office Clerks							.59	.43	1.02	2.60	.50	3.10				1.01	.31	1.32
140399 - Filing, Ofc. Mac., Other	1.12	.30	1.41				.60	.43	1.03				.62	.28	.91			
140703 - Stenographers	.59	.30	.88															
140799 - Steno, Sec., Rel. Occup.				.38	.67	1.05	.67	.43	1.10	1.92	.50	2.42						
140999 - Typ., Rel. Occup., Other				.84	.67	1.51	.50	.43	.94									
160108 - Electronic Technology				.68	.67	1.34												
160113 - Mechanical Technology													1.55	.28	1.83			

TABLE I (continued)

SUMMARY OF COURSES AND COSTS IN THE SAMPLE SCHOOLS; PER PUPIL PER CONTACT HOUR

Course	A Dir. Cost	A Ind. Cost	A Tot.	B Dir. Cost	B Ind. Cost	B Tot.	C Dir. Cost	C Ind. Cost	C Tot.	D Dir. Cost	D Ind. Cost	D Tot.	E Dir. Cost	E Ind. Cost	E Tot.	F Dir. Cost	F Ind. Cost	F Tot.
170301 - Body and Fender							.89	.43	1.32	.54	.50	1.04						
170302 - Mechanics	.85	.30	1.14	1.43	.67	2.09	.48	.43	.91	.71	.50	1.21				1.65	.31	1.96
170499 - Aviation Occup., Other				.68	.67	1.35												
170799 - Commercial Art Occup., Other				.53	.67	1.20	.43	.43	.87									
171001 - Carpentry							.73	.43	1.17									
171002 - Electricity							.66	.43	1.09									
171004 - Masonry							.55	.43	.98									
171300 - Drafting	.55	.30	.84	.49	.67	1.15	.58	.43	1.02	.44	.50	.94						
171401 - Ind. Electrician										.74	.50	1.25				.88	.31	1.19
171499 - Elect. Occup., Other													.36	.28	.64			
171503 - Radio/Television	1.52	.30	1.82				.58	.43	1.01	.70	.50	1.21				.98	.31	1.30
171901 - Comp., Mkup., Typeset							1.00	.43	1.43									
171902 - Print. Press Occup.							1.26	.43	1.69									
171999 - Graphic Arts, Other				2.09	.67	2.75				.69	.50	1.19						
172302 - Machine Shop				1.17	.67	1.84	.64	.43	1.07							2.29	.31	2.60
172305 - Sheet Metal				.72	.67	1.39	.96	.43	1.39							.85	.31	1.16

TABLE I (continued)

SUMMARY OF COURSES AND COSTS IN THE SAMPLE SCHOOLS; PER PUPIL PER CONTACT HOUR

Course	A Dir. Cost	A Ind. Cost	A Tot.	B Dir. Cost	B Ind. Cost	B Tot.	C Dir. Cost	C Ind. Cost	C Tot.	D Dir. Cost	D Ind. Cost	D Tot.	E Dir. Cost	E Ind. Cost	E Tot.	F Dir. Cost	F Ind. Cost	F Tot.
172306 - Welding and Cutting	.60	.30	.89	.68	.67	1.34	.73	.43	1.16							.88	.31	1.19
172399 - Metalworking, Other	2.11	.30	2.41															
172602 - Cosmetology	.64	.30	.94	.79	.67	1.46	.66	.43	1.10	.55	.50	1.05				.82	.31	1.13
172999 - Quan. Food Occup., Other	1.98	.30	2.28	1.25	.67	1.92				.54	.50	1.05						
173000 - Refrigeration	1.46	.30	1.76	.54	.67	1.21	1.10	.43	1.53									
173100 - Small Engine Repair													.44	.28	.72			
173302 - Tailoring							.67	.43	1.10									
173402 - Shoe Repair							1.02	.43	1.45									
173601 - Millwork & Cabinet Makg.	1.31	.30	1.61															
173699 - Woodworking, Other													.47	.28	.75			
179900 - Trade & Ind. Occup., Oth.				.52	.67	1.18	.45	.43	.89				.45	.28	.73			
990100 - Group Guid. (Prevoc.)	.66	.30	.96															
990300 - Remedial							1.44	.43	1.88	1.04	.50	1.54				1.16	.31	1.47
990400 - Other N.E.C.							.53	.43	.97							.46	.31	.78

contact hour) were also found to be associated with both course and school. All six schools were found to provide courses at or below this cost level. This level of cost was found for 27 different courses. It was also interesting to note that in two instances the same course was found to be both at the high cost and low cost levels depending upon the school location.

Indirect costs were those costs associated with a specific school district and ranged from a low of 28 cents in the district in which school "E" was located to a high of 67 cents in the school district in which school "B" was situated. Direct costs were those costs identified with a specific course and ranged from a low of 22 cents for Comprehensive Homemaking to a high of $2.60 for General Office-Clerks. Cost differences can be seen to be primarily related to direct costs.

Cost Comparisons

Cost comparisons for vocational-technical education as related to pupil contact hours are shown in Table II. These costs are broken down to reveal, by course, high direct and indirect costs, low direct and indirect costs and means for both direct and indirect costs. Total costs at the high, low and mean levels are also shown.

The high cost of $3.10 per pupil contact hour was found to be identified with the course, General Office-Clerks, while the low cost of 64 cents per pupil contact hour was associated with Electrical Occupations.

Extremes in mean total cost were found to be represented at the high end by Metalworking at $2.41 per student contact hour. The low end of the continuum was found to be 44 cents and this was spent for each pupil contact hour in the course, Small Engine Repair. It should be remembered that mean

TABLE II

COST COMPARISON CHART FOR DELIVERY OF VOCATIONAL-TECHNICAL EDUCATION;
PER PUPIL PER CONTACT HOUR

Course	Direct Cost	+	Indirect Cost	=	HIGH Total*	Direct Cost	+	Indirect Cost	=	LOW Total	Mean** Direct Cost	Mean Indirect Cost	MEAN Total
010101 - Animal Science	.65		.30		.95	.65		.30		.95	.65	.30	.95
010199 - Agricultural Production, Other	.61		.30		.91	.61		.30		.91	.61	.30	.91
010299 - Agric. Supply/Serv., Other	.47		.28		.75	.47		.28		.75	.47	.28	.75
010305 - Agric. Mechanics Skills	1.07		.28		1.35	1.07		.28		1.35	1.07	.28	1.35
010504 - Landscaping	.64		.30		.93	.64		.30		.93	.64	.30	.93
010599 - Ornamental Hort., Other	1.16		.67		1.83	1.16		.67		1.83	1.16	.67	1.83
010704 - Wood Utilization	.37		.50		.87	.37		.50		.87	.37	.50	.87
049900 - Distributive Education, Other	1.79		.28		2.07	.51		.31		.82	.91	.35	1.27
070302 - Practical (Vocational) Nursing	.65		.31		.96	.65		.31		.96	.65	.31	.96
070399 - Nursing, Other	.94		.50		1.44	.94		.50		1.44	.94	.50	1.44
079900 - Health Occup. Educ., Other	.57		.67		1.24	.54		.43		.97	.56	.60	1.16
090101 - Compr. Homemaking or Home Ec.	.51		.28		.79	.22		.50		.73	.42	.35	.77
090102 - Child Development	.52		.28		.80	.52		.28		.80	.52	.28	.80
090103 - Clothing and Textiles	1.54		.50		2.05	.65		.28		.93	.95	.36	1.31
090107 - Foods and Nutrition	1.51		.50		2.01	1.51		.50		2.01	1.51	.50	2.01
090199 - Homemaking, Other	.67		.43		1.10	.67		.43		1.10	.67	.43	1.10

*Totals may not = sums of individual costs due to rounding effect.

**Mean cost = the sum of sample costs ÷ total contact hours. Where high, low and mean are the same, only one course exists within the sample.

TABLE II (continued)

COST COMPARISON CHART FOR DELIVERY OF VOCATIONAL-TECHNICAL EDUCATION;
PER PUPIL PER CONTACT HOUR

Course	Direct Cost	+	Indirect Cost	=	HIGH Total	Direct Cost	+	Indirect Cost	=	LOW Total	Mean Direct Cost	Mean Indirect Cost	MEAN Total
090201 - Care and Guidance of Children	1.47		.50		1.97	.62		.31		.93	.81	.57	1.37
090203 - Food Mgmt., Prod. and Services	.74		.50		1.24	.74		.50		1.24	.74	.50	1.24
090299 - Occup. Prep., Other (H.E.)	.28		.67		.95	.28		.67		.95	.28	.67	.95
140102 - Bookkeepers	.61		.67		1.27	.81		.31		1.12	.63	.62	1.25
140203 - Programmers	.34		.67		1.01	.34		.67		1.01	.34	.67	1.01
140303 - General Office Clerks	2.60		.50		3.10	.59		.43		1.02	.85	.43	1.28
140399 - Filing, Off. Mach., Gen. Off., Oth.	1.12		.30		1.41	.62		.28		.91	.65	.38	1.02
140703 - Stenographers	.59		.30		.88	.59		.30		.88	.59	.30	.88
140799 - Steno., Sec., Rel. Occup., Other	1.92		.50		2.43	.38		.67		1.05	.66	.54	1.20
140999 - Typing, Rel. Occup., Other	.84		.67		1.51	.50		.43		.94	.67	.55	1.22
160108 - Electronic Technology	.68		.67		1.34	.68		.67		1.34	.68	.67	1.34
160113 - Mechanical Technology	1.55		.28		1.83	1.55		.28		1.83	1.55	.28	1.83
170301 - Body and Fender	.89		.43		1.32	.54		.50		1.04	.64	.48	1.12
170302 - Mechanics	1.43		.67		2.09	.48		.43		.91	.92	.46	1.38
170499 - Aviation Occupations, Other	.68		.67		1.35	.68		.67		1.35	.68	.67	1.35
170799 - Commercial Art Occup., Other	.53		.67		1.20	.43		.43		.87	.48	.57	1.05

TABLE II (continued)

COST COMPARISON CHART FOR DELIVERY OF VOCATIONAL-TECHNICAL EDUCATION;
PER PUPIL PER CONTACT HOUR

Course	Direct Cost	+	Indirect Cost	=	HIGH Total	Direct Cost	+	Indirect Cost	=	LOW Total	Mean Direct Cost	Mean Indirect Cost	MEAN Total
171001 - Carpentry	.73		.43		1.17	.73		.43		1.17	.73	.43	1.17
171002 - Electricity	.66		.43		1.09	.66		.43		1.09	.66	.43	1.09
171004 - Masonry	.55		.43		.98	.55		.43		.98	.55	.43	.98
171300 - Drafting	.49		.67		1.15	.55		.30		.84	.51	.48	1.00
171401 - Industrial Electrician	.74		.50		1.25	.88		.31		1.19	.81	.41	1.22
171499 - Electrical Occupations, Other	.36		.28		.64	.36		.28		.64	.36	.28	.64
171503 - Radio/Television	1.52		.30		1.82	.58		.43		1.01	.82	.41	1.23
171901 - Composition, Makeup, Typeset	1.00		.43		1.43	1.00		.43		1.43	1.00	.43	1.43
171902 - Printing Press Occupations	1.26		.43		1.69	1.26		.43		1.69	1.26	.43	1.69
171999 - Graphic Arts, Other	2.09		.67		2.75	.68		.50		1.19	1.38	.58	1.97
172302 - Machine Shop	2.29		.31		2.60	.63		.43		1.07	1.15	.49	1.64
172305 - Sheet Metal	.72		.67		1.39	.85		.31		1.16	.81	.53	1.34
172306 - Welding and Cutting	.68		.67		1.34	.60		.30		.89	.72	.44	1.16
172399 - Metalworking, Other	2.11		.30		2.41	2.11		.30		2.41	2.11	.30	2.41

TABLE II (continued)

COST COMPARISON CHART FOR DELIVERY OF VOCATIONAL-TECHNICAL EDUCATION;
PER PUPIL PER CONTACT HOUR

Course	Direct Cost	+	Indirect Cost	=	HIGH Total	Direct Cost	+	Indirect Cost	=	LOW Total	Mean Direct Cost	Mean Indirect Cost	MEAN Total
172602 - Cosmetology	.79		.67		1.46	.64		.30		.94	.67	.47	1.14
172999 - Quantity Food Occup., Other	1.98		.30		2.28	.54		.50		1.05	1.05	.56	1.61
173000 - Refrigeration	1.46		.30		1.76	.54		.67		1.21	.83	.55	1.38
173100 - Small Engine Repair	.44		.28		.72	.44		.28		.72	.44	.28	.72
173302 - Tailoring	.67		.43		1.10	.67		.43		1.10	.67	.43	1.10
173402 - Shoe Repair	1.02		.43		1.45	1.02		.43		1.45	1.02	.43	1.45
173601 - Millwork and Cabinet Making	1.31		.30		1.61	1.31		.30		1.61	1.31	.30	1.61
173699 - Woodworking, Other	.47		.28		.75	.47		.28		.75	.47	.28	.75
179900 - Trade and Indus. Occupation, Other	.52		.67		1.18	.45		.28		.73	.47	.46	.93
990100 - Group Guidance (Prevocational)	.66		.30		.96	.66		.30		.96	.66	.30	.96
990300 - Remedial (Vocational Impr. Pgm.)	1.44		.43		1.88	1.16		.31		1.47	1.25	.42	1.67
990400 - Other N.E.C.	.53		.43		.97	.46		.31		.78	.51	.39	.91

as used in this study resulted from all expenditures and student contact hours in the study schools where the same course or program category was found.

High mean direct costs were found for Metalworking at $2.11. Low mean direct costs of 34 cents was found for the course, Programmers. High mean indirect costs were found to be 67 cents and were associated with non-related courses which ranged from Ornamental Horticulture to Aviation Occupations, Others. Low mean indirect costs of 28 cents were found for seven courses, two of which were in agriculture and the other five ranged from Child Development to Woodworking, Other.

It was apparent that the use of means tempered both the highs and the lows for direct, indirect and total costs. It was also apparent that predictions of costs, using data from Table II, would be most accurate if mean data were used.

Direct Costs

Direct costs were found, from data presented in Tables I and II, to make up the major share of the total delivery cost of each course. Information identified with teacher salaries, teaching space, teaching equipment and teaching materials was collected as separate items. It was therefore possible to organize these data to show how each cost category related to total cost of each program category or specific course. The costs shown here were labeled as means and are functions of all costs identified directly with courses and/or categories of courses, total contact hours per year and all students enrolled in a course or category or courses. Detail of this data organization is shown in Table III.

TABLE III

COST OF VOCATIONAL PROGRAMS PER STUDENT CONTACT HOUR

PROGRAM CATEGORY OR COURSE	COST CATEGORY	CONTACT HOURS PER YEAR	NO. OF STUDENTS	TOTAL COST	UNIT COST
AGRICULTURE	INDIRECT COSTS	110250	491	44645.49	0.40
01	TEACHER SALARIES	110250	491	55484.99	0.50
	SPACE	110250	491	5341.82	0.05
	EQUIPMENT	110250	491	6005.86	0.05
	MATERIALS	110250	491	2450.00	0.02
				TOTAL	$ 1.03
DISTRIBUTIVE EDUC.	INDIRECT COSTS	58625	181	21226.85	0.36
04	TEACHER SALARIES	58625	181	39508.20	0.67
	SPACE	58625	181	2205.54	0.04
	EQUIPMENT	58625	181	858.02	0.01
	MATERIALS	58625	181	1050.00	0.02
				TOTAL	$ 1.11
HEALTH OCCUPATIONS	INDIRECT COSTS	75425	207	38604.05	0.51
07	TEACHER SALARIES	75425	207	40659.00	0.54
	SPACE	75425	207	1966.45	0.03
	EQUIPMENT	75425	207	1972.82	0.03
	MATERIALS	75425	207	2300.00	0.03
				TOTAL	$ 1.13

TABLE III (continued)

COST OF VOCATIONAL PROGRAMS PER STUDENT CONTACT HOUR

PROGRAM CATEGORY OR COURSE	COST CATEGORY	CONTACT HOURS PER YEAR	NO. OF STUDENTS	TOTAL COST	UNIT COST
HOME ECONOMICS	INDIRECT COSTS	428050	1737	205853.30	0.48
09	TEACHER SALARIES	428050	1737	173771.30	0.41
	SPACE	428050	1737	8579.17	0.02
	EQUIPMENT	428050	1737	9869.60	0.02
	MATERIALS	428050	1737	9591.00	0.02
				TOTAL	$ 0.95
OFFICE OCCUPATIONS	INDIRECT COSTS	251300	1055	126555.40	0.50
14	TEACHER SALARIES	251300	1055	139546.50	0.56
	SPACE	251300	1055	7003.16	0.03
	EQUIPMENT	251300	1055	15114.96	0.06
	MATERIALS	251300	1055	7200.00	0.03
				TOTAL	$ 1.18
TECHNICAL EDUCATION	INDIRECT COSTS	29225	103	16870.90	0.58
16	TEACHER SALARIES	29225	103	18790.00	0.64
	SPACE	29225	103	2924.39	0.10
	EQUIPMENT	29225	103	3245.40	0.11
	MATERIALS	29225	103	800.00	0.03
				TOTAL	$ 1.46

TABLE III (continued)

COST OF VOCATIONAL PROGRAMS PER STUDENT CONTACT HOUR

PROGRAM CATEGORY OR COURSE	COST CATEGORY	CONTACT HOURS PER YEAR	NO. OF STUDENTS	TOTAL COST	UNIT COST
BODY AND FENDER	INDIRECT COSTS	60900	116	29389.45	0.48
170301	TEACHER SALARIES	60900	116	29553.00	0.49
	SPACE	60900	116	4154.52	0.07
	EQUIPMENT	60900	116	3922.26	0.06
	MATERIALS	60900	116	1305.00	0.02
				TOTAL	$ 1.12
MECHANICS	INDIRECT COSTS	124950	238	56939.82	0.46
170302	TEACHER SALARIES	124950	238	67443.75	0.54
	SPACE	124950	238	8850.64	0.07
	EQUIPMENT	124950	238	34679.61	0.28
	MATERIALS	124950	238	4425.00	0.04
				TOTAL	$ 1.38
AVIATION OCCUPATIONS	INDIRECT COSTS	23625	45	15772.16	0.67
170499	TEACHER SALARIES	23625	45	10138.00	0.43
	SPACE	23625	45	1430.24	0.06
	EQUIPMENT	23625	45	2006.80	0.08
	MATERIALS	23625	45	2500.00	0.11
				TOTAL	$ 1.35

TABLE III (continued)

COST OF VOCATIONAL PROGRAMS PER STUDENT CONTACT HOUR

PROGRAM CATEGORY OR COURSE	COST CATEGORY	CONTACT HOURS PER YEAR	NO. OF STUDENTS	TOTAL COST	UNIT COST
COMMERCIAL ART OCCUP	INDIRECT COSTS	43400	102	23540.52	0.54
170799	TEACHER SALARIES	43400	102	19042.00	0.44
	SPACE	43400	102	1101.11	0.03
	EQUIPMENT	43400	102	310.70	0.01
	MATERIALS	43400	102	305.00	0.01
				TOTAL	$ 1.02
CARPENTRY	INDIRECT COSTS	20475	39	8853.13	0.43
171001	TEACHER SALARIES	20475	39	10164.00	0.50
	SPACE	20475	39	2176.14	0.11
	EQUIPMENT	20475	39	1972.30	0.10
	MATERIALS	20475	39	688.00	0.03
				TOTAL	$ 1.17
ELECTRICITY	INDIRECT COSTS	20475	39	8853.13	0.43
171002	TEACHER SALARIES	20475	39	10973.00	0.54
	SPACE	20475	39	545.83	0.03
	EQUIPMENT	20475	39	1632.50	0.08
	MATERIALS	20475	39	272.00	0.01
				TOTAL	$ 1.09

TABLE III (continued)

COST OF VOCATIONAL PROGRAMS PER STUDENT CONTACT HOUR

PROGRAM CATEGORY OR COURSE	COST CATEGORY	CONTACT HOURS PER YEAR	NO. OF STUDENTS	TOTAL COST	UNIT COST
MASONRY	INDIRECT COSTS	19425	37	8399.12	0.43
171004	TEACHER SALARIES	19425	37	8955.00	0.46
	SPACE	19425	37	969.57	0.05
	EQUIPMENT	19425	37	375.00	0.02
	MATERIALS	19425	37	319.00	0.02
				TOTAL	$ 0.98
DRAFTING	INDIRECT COSTS	91350	174	44005.38	0.48
171300	TEACHER SALARIES	91350	174	41628.30	0.46
	SPACE	91350	174	2371.50	0.03
	EQUIPMENT	91350	174	1955.87	0.02
	MATERIALS	91350	174	1070.00	0.01
				TOTAL	$ 1.00
INDUST. ELECTRICIAN	INDIRECT COSTS	35700	68	14637.88	0.41
171401	TEACHER SALARIES	35700	68	20622.00	0.58
	SPACE	35700	68	971.87	0.03
	EQUIPMENT	35700	68	5952.20	0.17
	MATERIALS	35700	68	1400.00	0.04
				TOTAL	$ 1.22

TABLE (1) (continued)

COST OF VOCATIONAL PROGRAMS PER STUDENT CONTACT HOUR

PROGRAM CATEGORY OR COURSE	COST CATEGORY	CONTACT HOURS PER YEAR	NO. OF STUDENTS	TOTAL COST	UNIT COST
ELECT. OCCUPATIONS	INDIRECT COSTS	25900	74	7273.09	0.28
171499	TEACHER SALARIES	25900	74	7950.00	0.31
	SPACE	25900	74	705.46	0.03
	EQUIPMENT	25900	74	310.00	0.01
	MATERIALS	25900	74	300.00	0.01
				TOTAL	$ 0.64
RADIO/TELEVISION	INDIRECT COSTS	63000	120	25858.55	0.41
171503	TEACHER SALARIES	63000	120	40884.30	0.65
	SPACE	63000	120	3325.59	0.05
	EQUIPMENT	63000	120	6363.42	0.10
	MATERIALS	63000	120	1166.00	0.02
				TOTAL	$ 1.23
COMP.,MAKEUP,TYPESET	INDIRECT COSTS	12600	24	5448.07	0.43
171901	TEACHER SALARIES	12600	24	10973.00	0.87
	SPACE	12600	24	485.14	0.04
	EQUIPMENT	12600	24	1000.00	0.08
	MATERIALS	12600	24	142.00	0.01
				TOTAL	$ 1.43

TABLE III (continued)

COST OF VOCATIONAL PROGRAMS PER STUDENT CONTACT HOUR

PROGRAM CATEGORY OR COURSE	COST CATEGORY	CONTACT HOURS PER YEAR	NO. OF STUDENTS	TOTAL COST	UNIT COST
PRINTING PRESS OCCUP	INDIRECT COSTS	12075	23	5221.07	0.43
171902	TEACHER SALARIES	12075	23	12074.00	1.00
	SPACE	12075	23	485.50	0.04
	EQUIPMENT	12075	23	2384.50	0.20
	MATERIALS	12075	23	211.00	0.02
				TOTAL	$ 1.69
GRAPHIC ARTS, OTHER	INDIRECT COSTS	39725	113	21606.75	0.54
171999	TEACHER SALARIES	39725	113	28935.00	0.73
	SPACE	39725	113	2435.18	0.06
	EQUIPMENT	39725	113	6361.45	0.16
	MATERIALS	39725	113	3300.00	0.08
				TOTAL	$ 1.58
MACHINE SHOP	INDIRECT COSTS	89250	170	43339.03	0.49
172302	TEACHER SALARIES	89250	170	41149.00	0.46
	SPACE	89250	170	4846.28	0.05
	EQUIPMENT	89250	170	53920.60	0.60
	MATERIALS	89250	170	2325.00	0.03
				TOTAL	$ 1.63

TABLE III (continued)

COST OF VOCATIONAL PROGRAMS PER STUDENT CONTACT HOUR

PROGRAM CATEGORY OR COURSE	COST CATEGORY	CONTACT HOURS PER YEAR	NO. OF STUDENTS	TOTAL COST	UNIT COST
SHEET METAL	INDIRECT COSTS	48825	113	24521.28	0.50
172305	TEACHER SALARIES	48825	113	28045.00	0.57
	SPACE	48825	113	3636.05	0.07
	EQUIPMENT	48825	113	7213.80	0.15
	MATERIALS	48825	113	1582.00	0.03
				TOTAL	$ 1.33
WELDING AND CUTTING	INDIRECT COSTS	78750	150	34580.68	0.44
172306	TEACHER SALARIES	78750	150	38596.80	0.49
	SPACE	78750	150	4968.52	0.06
	EQUIPMENT	78750	150	9487.74	0.12
	MATERIALS	78750	150	3362.00	0.04
				TOTAL	$ 1.16
METALWORKING, OTHER	INDIRECT COSTS	7350	14	2182.27	0.30
172399	TEACHER SALARIES	7350	14	7611.30	1.04
	SPACE	7350	14	1516.02	0.21
	EQUIPMENT	7350	14	5978.57	0.81
	MATERIALS	7350	14	400.00	0.05
				TOTAL	$ 2.41

TABLE III (continued)

COST OF VOCATIONAL PROGRAMS PER STUDENT CONTACT HOUR

PROGRAM CATEGORY OR COURSE	COST CATEGORY	CONTACT HOURS PER YEAR	NO. OF STUDENTS	TOTAL COST	UNIT COST
COSMETOLOGY	INDIRECT COSTS	129675	247	61265.94	0.47
172602	TEACHER SALARIES	129675	247	71010.25	0.55
	SPACE	129675	247	4329.60	0.03
	EQUIPMENT	129675	247	8080.22	0.06
	MATERIALS	129675	247	3517.00	0.03
				TOTAL	$ 1.14
QUANTITY FOOD OCCUP.	INDIRECT COSTS	42700	97	23003.84	0.54
172999	TEACHER SALARIES	42700	97	35187.39	0.82
	SPACE	42700	97	2423.53	0.06
	EQUIPMENT	42700	97	4342.61	0.10
	MATERIALS	42700	97	1225.00	0.03
				TOTAL	$ 1.55
REFRIGERATION	INDIRECT COSTS	46725	89	25752.45	0.55
173000	TEACHER SALARIES	46725	89	28713.80	0.61
	SPACE	46725	89	3590.25	0.08
	EQUIPMENT	46725	89	2563.96	0.05
	MATERIALS	46725	89	3687.00	0.08
				TOTAL	$ 1.38

TABLE III (continued)

COST OF VOCATIONAL PROGRAMS PER STUDENT CONTACT HOUR

PROGRAM CATEGORY OR COURSE	COST CATEGORY	CONTACT HOURS PER YEAR	NO. OF STUDENTS	TOTAL COST	UNIT COST
SMALL ENGINE REPAIR	INDIRECT COSTS	24150	69	6781.66	0.28
173100	TEACHER SALARIES	24150	69	9110.00	0.38
	SPACE	24150	69	705.46	0.03
	EQUIPMENT	24150	69	613.90	0.03
	MATERIALS	24150	69	200.00	0.01
				TOTAL	$ 0.72
TAILORING	INDIRECT COSTS	18900	36	8172.11	0.43
173302	TEACHER SALARIES	18900	36	10710.00	0.57
	SPACE	18900	36	987.52	0.05
	EQUIPMENT	18900	36	654.50	0.03
	MATERIALS	18900	36	341.00	0.02
				TOTAL	$ 1.10
SHOE REPAIR	INDIRECT COSTS	9975	19	4313.06	0.43
173402	TEACHER SALARIES	9975	19	8701.00	0.87
	SPACE	9975	19	522.85	0.05
	EQUIPMENT	9975	19	778.75	0.08
	MATERIALS	9975	19	143.00	0.01
				TOTAL	$ 1.45

TABLE III (continued)

COST OF VOCATIONAL PROGRAMS PER STUDENT CONTACT HOUR

PROGRAM CATEGORY OR COURSE	COST CATEGORY	CONTACT HOURS PER YEAR	NO. OF STUDENTS	TOTAL COST	UNIT COST
MILLWORK, CABINETMAK	INDIRECT COSTS	12075	23	3585.16	0.30
173601	TEACHER SALARIES	12075	23	11571.73	0.96
	SPACE	12075	23	2347.39	0.19
	EQUIPMENT	12075	23	1532.00	0.13
	MATERIALS	12075	23	400.00	0.03
				TOTAL	$ 1.61
WOODWORKING, OTHER	INDIRECT COSTS	24850	71	6978.23	0.28
173699	TEACHER SALARIES	24850	71	8850.00	0.36
	SPACE	24850	71	2057.60	0.08
	EQUIPMENT	24850	71	200.00	0.01
	MATERIALS	24850	71	544.00	0.02
				TOTAL	$ 0.75
TRADE & INDUS OCCUP.	INDIRECT COSTS	81200	252	39264.84	0.48
179900	TEACHER SALARIES	81200	252	33712.00	0.42
	SPACE	81200	252	2318.04	0.03
	EQUIPMENT	81200	252	971.30	0.01
	MATERIALS	81200	252	1890.00	0.02
				TOTAL	$ 0.96

TABLE III (continued)

COST OF VOCATIONAL PROGRAMS PER STUDENT CONTACT HOUR

PROGRAM CATEGORY OR COURSE	COST CATEGORY	CONTACT HOURS PER YEAR	NO. OF STUDENTS	TOTAL COST	UNIT COST
SPECIAL PROGRAMS	INDIRECT COSTS	182700	686	65839.38	0.36
99	TEACHER SALARIES	182700	686	119869.10	0.66
	SPACE	182700	686	4242.39	0.02
	EQUIPMENT	182700	686	3121.23	0.02
	MATERIALS	182700	686	3700.00	0.02
				TOTAL	$ 1.08

Teacher salaries were consistently found to make up the large part of direct costs for the delivery of vocational-technical education courses. In all but four instances salary costs exceeded the total of indirect costs when related to specific courses and to program categories. Costs related to teaching materials were found, with few exceptions, to be smallest of the direct costs and seldom exceeded three cents.

Teaching space costs ranged from a high of 21 cents for Metalworking - Other, to a low of two cents for Special Programs and Home Economics. Space costs were found to relate directly to total direct costs and directly to total costs. That is, the highest cost courses or program categories were found to reflect the highest space costs.

Equipment costs followed a pattern similar to that found for space. The range was broader, from one through 81, and related directly to high and low cost totals.

Only five courses were found to have direct costs for space, equipment, and materials that together exceeded 25 cents. It is also evident from the data shown in this table that teachers' salaries plus indirect costs constitute more than seventy percent of all delivery costs for vocational courses and categories of vocational programs. Highest direct costs for vocational course delivery by student contact hour were those identified within the 17 category, Trade and Industrial Occupations (see Appendix B).

Cost Projections

Projections of expected program category and course costs over a five year period are presented in Table IV. The data are a compilation of means of

student contact hour costs which were derived from the sum of the total direct and indirect costs in each category or course. These means, compiled for the 1972-73 school year, are the base-line data and were used to project category and course costs for five years. Projected costs were derived by using an exponential curve formula[2] with a five percent inflation factor.

Information from Table IV can be used by the educational planner to predict the cost of a vocational-technical education program category or course. In addition to the data found in the table, the planner would need information which includes the number of students to be served and the number of contact hours needed to teach the course. If new space and equipment were needed, these would add to the cost.

Another use for the data found in this table relates to budgeting. If, for example, a vocational program includes a class of Auto Body and Fender which costs $1.12 per student contact hour in 1972-73 were expected to be operated next year for 20 students for 170 contact hours, the total cost should be about 20 x 170 x $1.18 for a total cost of $4,012 or about $200 per student (assuming space and equipment are available).

---

[2] Projected cost = $C_i(r+1)^t$

C_i = Program cost from Table IV
r = 5 percent change for inflation
t = Time

TABLE IV

PROGRAM COST PROJECTIONS

PROGRAM COURSE OR CATEGORY	PROJECTED COST BASED ON CURRENT ENROLLMENT					
	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
AGRICULTURE 01	1.03	1.09	1.14	1.20	1.26	1.32
DISTRIBUTIVE EDUC. 04	1.11	1.16	1.22	1.28	1.34	1.41
HEALTH OCCUPATIONS 07	1.13	1.19	1.25	1.31	1.38	1.45
HOME ECONOMICS 09	0.95	1.00	1.05	1.10	1.16	1.22
OFFICE OCCUPATIONS 14	1.18	1.23	1.30	1.36	1.43	1.50
TECHNICAL EDUCATION 16	1.46	1.53	1.61	1.69	1.77	1.86
BODY AND FENDER 170301	1.12	1.18	1.24	1.30	1.36	1.43
MECHANICS 170302	1.38	1.45	1.52	1.60	1.68	1.76
AVIATION OCCUPATIONS 170499	1.35	1.42	1.49	1.56	1.64	1.72
COMMERCIAL ART OCCUP 170799	1.02	1.07	1.13	1.18	1.24	1.30
CARPENTRY 171001	1.17	1.22	1.28	1.35	1.42	1.49
ELECTRICITY 171002	1.09	1.14	1.20	1.26	1.32	1.39
MASONRY 171004	0.98	1.03	1.08	1.13	1.19	1.25
DRAFTING 171300	1.00	1.05	1.10	1.15	1.21	1.27
INDUST. ELECTRICIAN 171401	1.22	1.28	1.35	1.41	1.48	1.56
ELECT. OCCUPATIONS 171499	0.64	0.67	0.70	0.74	0.78	0.81
RADIO/TELEVISION 171503	1.23	1.29	1.36	1.43	1.50	1.57

TABLE IV (continued)

PROGRAM COST PROJECTIONS

PROGRAM COURSE OR CATEGORY	PROJECTED COST BASED ON CURRENT ENROLLMENT					
	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
COMP.,MAKEUP,TYPESET 171901	1.43	1.50	1.58	1.66	1.74	1.83
PRINTING PRESS OCCUP 171902	1.69	1.77	1.86	1.95	2.05	2.15
GRAPHIC ARTS, OTHER 171999	1.58	1.66	1.74	1.83	1.92	2.01
MACHINE SHOP 172302	1.63	1.71	1.80	1.89	1.98	2.08
SHEET METAL 172305	1.33	1.40	1.47	1.54	1.62	1.70
WELDING AND CUTTING 172306	1.16	1.21	1.27	1.34	1.40	1.47
METALWORKING, OTHER 172399	2.41	2.53	2.65	2.79	2.93	3.07
COSMETOLOGY 172602	1.14	1.20	1.26	1.32	1.39	1.46
QUANTITY FOOD OCCUP. 172999	1.55	1.63	1.71	1.79	1.88	1.98
REFRIGERATION 173000	1.38	1.45	1.52	1.59	1.67	1.76
SMALL ENGINE REPAIR 173100	0.72	0.76	0.79	0.83	0.88	0.92
TAILORING 173302	1.10	1.16	1.22	1.28	1.34	1.41
SHOE REPAIR 173402	1.45	1.52	1.60	1.68	1.76	1.85
MILLWORK, CABINETMAK 173601	1.61	1.69	1.77	1.86	1.96	2.05
WOODWORKING, OTHER 173699	0.75	0.79	0.83	0.87	0.91	0.96
TRADE & INDUS OCCUP. 179900	0.96	1.01	1.06	1.11	1.17	1.23
SPECIAL PROGRAMS 99	1.08	1.13	1.19	1.25	1.31	1.37

Program Costs Projected

The data collected for the study were further organized to show program cost projections by school. These projections are based on current and maximum vocational student enrollments found within each school. Projections were based on mean costs of total vocational-technical education programs in each school and were designed to forecast costs for a period of five years.

Current costs were shown in Table V for 1972-73 and these costs were also adjusted to show costs if each school's facility were used at capacity. Reflection of a five percent inflation factor was recognized in the costs shown for each year which followed.

Two obvious facts emerged from scrutiny of the data: (1) costs tend to decrease as a school approaches maximum or capacity enrollments in total programs; and (2) no real relationship exists between size of school and breadth of program and level of cost. Cost relates more directly to program category and specific courses. Some are high cost and some are low cost courses regardless of where they are taught.

SUMMARY AND CONCLUSIONS

Summary

The six sample schools were geographically representative of the State with Northside in Memphis in the southwest and Johnson City Vocational in the northeast. The central and south central areas provided the location of the other four schools: Warren County High, McGavock, Bradley and Kirkman high schools. The schools were also representative of large and small schools

TABLE V

PROGRAM COST PROJECTIONS BY SCHOOL BASED ON CURRENT AND MAXIMUM ENROLLMENTS

School	Program Cost Projections											
	1972-73		1973-74		1974-75		1975-76		1976-77		1977-78	
	Current Enrollment Basis	Maximum Enrollment Basis	Current Enrollment Basis	Maximum Enrollment Basis	Current Enrollment Basis	Maximum Enrollment Basis	Current Enrollment Basis	Maximum Enrollment Basis	Current Enrollment Basis	Maximum Enrollment Basis	Current Enrollment Basis	Maximum Enrollment Basis
A	1.05	.97	1.11	1.01	1.16	1.06	1.22	1.12	1.28	1.17	1.35	1.23
B	1.32	.94	1.38	.99	1.45	1.04	1.53	1.09	1.60	1.15	1.68	1.20
C	1.10	.96	1.16	1.01	1.21	1.06	1.28	1.11	1.34	1.17	1.41	1.23
D	1.12	.86	1.18	.91	1.23	.95	1.30	1.00	1.36	1.05	1.43	1.10
E	.87	.70	.91	.74	.96	.78	1.01	.82	1.06	.86	1.11	.90
F	1.20	1.00	1.26	1.05	1.33	1.11	1.39	1.16	1.46	1.22	1.54	1.28

and of schools in rural and urban settings. Most importantly the schools offered vocational programs with the largest number of courses. Fifty-eight different courses were taught in 109 separate classes in these six schools. Two of the classes were taught in five of the six schools and 32 different classes were made available in only one school.

High costs per student contact hour were found to be associated with both course and school. There was no evidence that size of school or geographical location were important in determining the cost level. There was an observed tendency for course costs in all schools to cluster towards the low.

Direct costs, primarily teachers' salaries, were found to be the largest factor in the cost breakdown. Other direct costs (those for space, equipment and materials) were generally low because space and equipment costs were inclusive only of a share of these costs depending upon the years of life of each.

Mean costs, except in cases where a course was taught in only one school, tempered both the highs and the lows and were probably more representative because they were the result of all costs and all student hours. The influence of single course costs was partially reduced by developing means by program category, i.e., Agriculture.

Projected costs were based on the means which were available for courses, program categories and programs by school. It was apparent that these projected costs could be used by planners and budget makers.

Conclusions

The importance of this study relates to the data collected and organized in the tables presented in the report. Comparisons which would make possible conclusions relative to whether a course costs too much or not enough in a given school would be difficult to make because needed standards have not yet been established. However, some indicators were identified from this study where it was shown that the same course was high cost in one school and considerably lower in another, i.e., Stenography, Secretary Related Occupations, Other (see Table I).

There is evidence that costs relate to program categories, courses and course enrollments and not to school size, school location or program breadth. It follows that costs of programs are increased or reduced by the number of high and low cost courses contained within each.

Indirect costs when taken together were found to represent a major category of cost in all program categories and courses. If teacher salaries, from direct costs, are added to indirect costs this total of these two cost factors represents more than 70 percent of the student contact hour cost of every program category and course.

The cost factors and projected costs found in the report of this study can be useful as planning and budget making tools. If, for example, a new Distributive Education course is needed; if space and equipment are available to teach such a course and if it is anticipated that enrollments will be comparably proportionate to enrollments in the given school for the base year 1972-73; then, the cost of initiating and operating such a course could be approximated. The procedure would be as follows: multiply the number of

contact hours needed to teach the course by the number of students to be enrolled; multiply this result by the projected cost per student contact hour for the year when the course was to be offered (see Table IV); the result should be near the desired course cost. (Example - D.E. course "Y" requires 80 class contact hours; anticipated enrollment is 15; cost at initiation in 1975-76 is $1.28/student contact hour from Table IV; 80 x 15 x $1.28 = $1,436.

It should be recognized that the cost indicated above does not reflect maximum enrollments, which would reduce it, or costs for space or equipment except on a proportional share basis. In fact, only about .02 of the cost of space and about .05 of the cost of equipment are a part of the $1.28 used. The $1.28 cost does include the five percent per year inflation factor.

Extension of this study to include more or all secondary schools with vocational-technical programs would make for more accurate and usable data. These data are accurate and usable within the limitations and delimitations of the study.

RECOMMENDATION

It is recommended that, because of the renewed interest by educators and communities which has led to the growth in vocational-technical education and because of the need for cost analysis data in making school district and State level decisions, additional studies should be made using procedures involved in this study. The additional studies needed and recommended are:

1. A study which extends this cost analysis concept to all secondary school vocational-technical programs in the State of Tennessee.

2. A study which applies this cost analysis concept to general, academic and non-vocational programs in secondary schools in the State of Tennessee.

3. A study which compares costs between and among programs: general, academic, other non-vocational and vocational-technical programs.

APPENDIX A

DIRECT COSTS

1. Teacher Salaries

Teacher's time in terms of annual salary. This salary is figured on six periods a day for 175 days. The salary is divided by the product of the number of students and the number of hours the course is taught per year.

2. Equipment

The actual cost of the equipment in each program course or category divided by the life span of that equipment. This quotient is then divided by the product of the number of students and the number of hours the course is taught per year.

3. Materials

Those supplies and materials directly applicable to the particular program course or category. The materials cost is divided by the product of number of students and the number of hours per year the course is taught.

4. Space

The area in square feet required to conduct a particular program course or category divided by the total area of the school multiplied by the total cost of the school. This product is then divided by the product of the number of students and the number of hours the course is taught per year.

INDIRECT COSTS

Indirect costs are identified in twelve (12) basic categories.

Category 001. Board of Education

This topic consists of all expenditures incurred by the board of education. Among these expenses are: (a) reimbursement to board members; and (b) secretary to the board.

Category 002. Salaries

This category indicates all salary expenditures of both certified and non-certified personnel (excluding teachers). It includes the superintendent of schools, personnel assisting the superintendent and administration, purchasing office, accounting personnel, clerks in administration, other salaries for administration, consultant or supervisor salaries, the specific building level principal's salaries, specific school guidance personnel, materials clerks, audio visual personnel, psychological personnel, TV instructional personnel, teacher aides, attendant personnel, health services personnel, pupil transportation personnel (including supervisors and bus drivers), mechanics and other garage employees, operation of plant engineers, custodial salary at a specific school, salaries of maintenance of plant personnel (system wide), salaries for food service personnel and substitute teachers, etc.

Category 003. Supplies and Materials for Administration

This category consists of all expenditures incurred relative to supplies and materials utilized in the administration of the superintendent's office, accounting personnel, data processing supplies, and other expenditures for administration.

Category 004. Supplies and Materials for Instruction

This category consists of expenditures relative to the instructional process both district level and specific school. The following categories are included: other supplies for instruction, textbooks (if applicable to vocational-technical education), school library and audio visual materials, periodicals and newspapers, and other materials for instruction.

Category 005. Contracted Services

The expenditures in this category reflect the following: (a) all travel expenses (for instructional personnel, administrative personnel, attendance teachers, health personnel, all supervisory travel, and other supportive services); (b) transportation (busing); (c) trustees' commission.

Category 006. Supplies and Materials for Supportive Services

This category includes all supplies and materials relative to the supportive services as listed: health, attendance, transportation, operation of plant, maintenance of plant and food services.

Category 007. Operational Services of School Plant

The following items are considered in this category: electric lights and power, telephone, heat, water and sewage.

Category 008. Maintenance of School Plant

This category consists of expenditures relative to: (a) grounds; (b) buildings; (c) equipment.

Category 009. Fixed Charges

This category reflects charges relative to retirement, social security, insurance, judgements, workman's compensation, rental of land and buildings and other fixed charges.

Category 010. Debt Service.

This category includes principal on debt, interest on bonds, principal on long-term notes, interest on debt, bank service charges, and other debt service from current funds.

Category 011. Expenses Incurred by Replacement of Equipment (Capital Outlay)

This category includes expenditures relative to site acquisition, site development, buildings, remodeling of buildings, renovation of building, equipment for administration, equipment for instruction, equipment for all supportive services, and other equipment.

Category 012. Other Expenses Incurred

The following items have been considered in this category: student body activities, community services and clearing accounts.

APPENDIX B

U.S.O.E. CODE NUMBERS FOR IDENTIFICATION AND CLASSIFICATION OF VOCATIONAL COURSE OFFERINGS

AGRICULTURE

* AGRICULTURAL PRODUCTION
- 01.0101 Animal Science
- 01.0102 Plant Science
- 01.0103 Farm Mechanics
- 01.0104 Farm Business Management
- 01.0199 Agricultural Production, Other

* AGRICULTURAL SUPPLIES/SERVICES
- 01.0201 Agricultural Chemicals
- 01.0202 Feeds
- 01.0203 Seeds
- 01.0204 Fertilizers (Plant Food)
- 01.0299 Agricultural Supplies/Services, Other

* AGRICULTURAL MECHANICS
- 01.0301 Agricultural Power and Machinery
- 01.0302 Agricultural Structures and Conveniences
- 01.0303 Soil Management
- 01.0304 Water Management
- 01.0305 Agricultural Mechanics Skills
- 01.0306 Agricultural Construction and Maintenance
- 01.0307 Agricultural Electrification
- 01.0399 Agricultural Mechanics, Other

* AGRICULTURAL PRODUCTS (PROCESSING, INSPECTION AND MARKETING)
- 01.0401 Food Products
- 01.0402 Nonfood Products
- 01.0499 Agricultural Products, Other

* ORNAMENTAL HORTICULTURE (PRODUCTION, PROCESSING, MARKETING, AND SERVICES)
- 01.0501 Arboriculture
- 01.0502 Floriculture
- 01.0503 Greenhouse Operation and Management
- 01.0504 Landscaping
- 01.0505 Nursery Operation and Management

ORNAMENTAL HORTICULTURE, cont'd
- 01.0506 Turf Management
- 01.0599 Ornamental Horticulture, Other

* AGRICULTURAL RESOURCES (CONSERVATION, UTILIZATION, AND SERVICES)
- 01.0601 Forests
- 01.0602 Recreation
- 01.0603 Soil
- 01.0604 Wildlife (Including Game Farms and Hunting Areas)
- 01.0605 Water
- 01.0606 Air
- 01.0607 Fish (Including Farms and Hatcheries)
- 01.0608 Range
- 01.0699 Other Agricultural Resources

* FORESTRY (PRODUCTION, PROCESSING, MANAGEMENT, MARKETING, AND SERVICES)
- 01.0701 Forests
- 01.0702 Forest Protection
- 01.0703 Logging (Harvesting and Transporting)
- 01.0704 Wood Utilization
- 01.0705 Recreation
- 01.0706 Special Products
- 01.0799 Forestry, Other

* AGRICULTURE, OTHER
- 01.9900 Agriculture, Other

DISTRIBUTIVE EDUCATION

- 04.0100 Advertising Services
- 04.0200 Apparel and Accessories
- 04.0300 Automotive
- 04.0400 Finance and Credit
- 04.0500 Floristry
- 04.0600 Food Distribution
- 04.0700 Food Services

DISTRIBUTIVE EDUCATION, cont'd

04.0800 General Merchandise
04.0900 Hardware, Building Materials, Farm and Garden Supplies and Equipment
04.1000 Home Furnishings
04.1100 Hotel and Lodging
04.1200 Industrial Marketing
04.1300 Insurance
04.1400 International Trade
04.1500 Personal Services
04.1600 Petroleum
04.1700 Real Estate
04.1800 Recreation and Tourism
04.1900 Transportation
04.2000 Retail Trade, Other
04.3100 Wholesale Trade, Other
04.9900 Distributive Education, Other

HEALTH OCCUPATIONS EDUCATION

* DENTAL
- 07.0101 Dental Assisting
- 07.0102 Dental Hygiene (Associate Degree)
- 07.0103 Dental Laboratory Technology
- 07.0199 Dental, Other

* MEDICAL LABORATORY TECHNOLOGY
- 07.0201 Cytology (Cytotechnology)
- 07.0202 Histology
- 07.0203 Medical Laboratory Assisting
- 07.0204 Hematology
- 07.0299 Medical Laboratory Technology, Other

* NURSING
- 07.0301 Nursing (Associate Degree)
- 07.0302 Practical (Vocational) Nursing
- 07.0303 Nursing Assistance (Aid)
- 07.0304 Psychiatric Aid
- 07.0305 Surgical Technician (Operating Room Technician)
- 07.0306 Obstetrical Technician
- 07.0307 Home Health Aid
- 07.0308 School Health Aid
- 07.0399 Nursing, Other

* REHABILITATION
- 07.0401 Occupational Therapy
- 07.0402 Physical Therapy
- 07.0403 Prosthetics
- 07.0404 Orthotice
- 07.0499 Rehabilitation, Other

* RADIOLOGIC
- 07.0501 Radiologic Technology (X-Ray)
- 07.0502 Radiation Therapy
- 07.0503 Nuclear Medical Technology
- 07.0599 Radiologic, Other

* OPHTHALMIC
- 07.0601 Ophthalmic Dispensing
- 07.0602 Orthoptics
- 07.0603 Optometrist Assistant
- 07.0699 Ophthalmic, Other

* ENVIRONMENTAL HEALTH
- 07.0701 Environmental Health Assistant
- 07.0702 Radiological Health Technician
- 07.0703 Sanitarian Assistant
- 07.0799 Environmental Health, Other

* MENTAL HEALTH TECHNOLOGY
  - 07.0801 Mental Health Technician
  - 07.0802 Mental Retardation Aid
  - 07.0899 Mental Health Technology, Other

* MISCELLANEOUS HEALTH OCCUPATIONS EDUCATION
  - 07.0901 Electroencephalograph Technician
  - 07.0902 Electrocardiograph Technician
  - 07.0903 Inhalation Therapy
  - 07.0904 Medical Assistant (Assistant in Physician's Office)
  - 07.0905 Central Supply Technician
  - 07.0906 Community Health Aid
  - 07.0907 Medical Emergency Technician
  - 07.0908 Food Service Supervisor
  - 07.0909 Mortuary Science
  - 07.0910 Orthopedic Assisting

* HEALTH OCCUPATIONS EDUCATION, OTHER
  - 07.9900 Health Occupations Education, Other

HOME ECONOMICS

* HOMEMAKING: PREPARATION FOR PERSONAL, HOME AND FAMILY LIVING
  - 09.0101 Comprehensive Homemaking or Home Economics
  - 09.0102 Child Development
  - 09.0103 Clothing and Textiles
  - 09.0104 Consumer Education
  - 09.0105 Family Health
  - 09.0106 Family Relations
  - 09.0107 Foods and Nutrition
  - 09.0108 Home Management
  - 09.0109 Housing and Home Furnishings
  - 09.0199 Homemaking, Other

* OCCUPATIONAL PREPARATION
  - 09.0201 Care and Guidance of Children
  - 09.0202 Clothing Management, Production, and Services
  - 09.0203 Food Management, Production, and Services
  - 09.0204 Home Furnishings, Equipment, and Services
  - 09.0205 Institutional and Home Management and Supporting Services
  - 09.0299 Occupational Preparation, Other

OFFICE OCCUPATIONS

* ACCOUNTING AND COMPUTING OCCUPATIONS
  - 14.0101 Accountants
  - 14.0102 Bookkeepers
  - 14.0103 Cashiers
  - 14.0104 Machine Operators: Billing, Bookkeeping, and Computing
  - 14.0105 Tellers
  - 14.0199 Accounting and Computing Occupations, Other

* BUSINESS DATA PROCESSING SYSTEMS OCCUPATIONS
  - 14.0201 Computer and Console Operators
  - 14.0202 Peripheral Equipment Operators
  - 14.0203 Programmers
  - 14.0204 Systems Analysts
  - 14.0299 Business Data Processing Systems Occupations, Other

* FILING, OFFICE MACHINES, AND GENERAL OFFICE CLERICAL OCCUPATIONS
  - 14.0301 Duplicating Machine Operators
  - 14.0302 File Clerks
  - 14.0303 General Office Clerks
  - 14.0399 Filing, Office Machines, and General Office Clerical Occupations, Other

* INFORMATION COMMUNICATION OCCUPATIONS
  - 14.0401 Communication Systems Clerks and Operators
  - 14.0402 Correspondence Clerks
  - 14.0403 Mail and Postal Clerks
  - 14.0404 Mail-Preparing and Mail-Handling Machine Operators
  - 14.0405 Messengers and Office Boys and Girls
  - 14.0406 Receptionists and Information Clerks
  - 14.0499 Information Communication Occupations, Other

* MATERIALS SUPPORT OCCUPATIONS (TRANSPORTING, STORING, AND RECORDING)
  - 14.0501 Planning and Production Clerks
  - 14.0502 Quality Control Clerks
  - 14.0503 Shipping and Receiving Clerks
  - 14.0504 Stock and Inventory Clerks
  - 14.0505 Traffic, Rate, and Transportation Clerks
  - 14.0599 Materials Support Occupations Transporting, Storing and Recording, Other

* PERSONNEL, TRAINING, AND RELATED OCCUPATIONS
  - 14.0601 Educational Assistants and Training Specialists
  - 14.0602 Interviewers and Test Technicians
  - 14.0603 Personnel Assistants
  - 14.0699 Personnel, Training, and Related Occupations, Other

* STENOGRAPHIC, SECRETARIAL, AND RELATED OCCUPATIONS
  - 14.0701 Executive Secretary
  - 14.0702 Secretaries
  - 14.0703 Stenographers
  - 14.0799 Stenographic, Secretarial and Related Occupations, Other

* SUPERVISORY AND ADMINISTRATIVE MANAGEMENT OCCUPATIONS
  - 14.0801 Administrative Assistants
  - 14.0802 Budget Management Analysts
  - 14.0803 Clerical and Office Supervisors
  - 14.0804 Data-Methods and System-Procedures Analysts
  - 14.0805 Office Managers and Chief Clerks
  - 14.0899 Supervisory and Administrative Management Occupations, Other

* TYPING AND RELATED OCCUPATIONS
  - 14.0901 Clerk-typist
  - 14.0902 Typists
  - 14.0999 Typing and Related Occupations, Other

* OFFICE OCCUPATIONS, OTHER
  - 14.9900 Office Occupations, Other

TECHNICAL EDUCATION

* ENGINEERING-RELATED TECHNOLOGY
  - 16.0101 Aeronautical Technology
  - 16.0102 Agricultural Technology
  - 16.0103 Architectural Technology (Building Construction)
  - 16.0104 Automotive Technology
  - 16.0105 Chemical Technology
  - 16.0106 Civil Technology
  - 16.0107 Electrical Technology
  - 16.0108 Electronic Technology
  - 16.0109 Electromechanical Technology
  - 16.0110 Environmental-Control Technology
  - 16.0111 Industrial Technology
  - 16.0112 Instrumentation Technology
  - 16.0113 Mechanical Technology
  - 16.0114 Metallurgical Technology
  - 16.0115 Nuclear Technology
  - 16.0116 Petroleum Technology
  - 16.0117 Scientific Data Processing
  - 16.0199 Engineering-Related Technology, Other

* AGRICULTURAL-RELATED TECHNOLOGY
  - 16.0201 Animal Science
  - 16.0202 Dairy Technology
  - 16.0203 Food Processing Technology
  - 16.0204 Plant Science
  - 16.0299 Agricultural-Related Technology, Other

* HEALTH-RELATED TECHNOLOGY
  - 16.0301 Dental Hygiene (Associate Degree)
  - 16.0302 Electroencaphalograph Technician
  - 16.0303 Medical Laboratory Assisting
  - 16.0304 Radiologic Technology (X-Ray)
  - 16.0305 Nursing (Associate Degree)
  - 16.0399 Health-Related Technology, Other

* OFFICE-RELATED TECHNOLOGY
  - 16.0401 Computer Programmer
  - 16.0402 Systems Analyst Technology
  - 16.0499 Office-Related Technology, Other

* HOME ECONOMICS-RELATED TECHNOLOGY
  - 16.0501 Child Care Center Assistant
  - 16.0502 Hospital Children's Division Assistant
  - 16.0103 Teacher's Assistant at the Preprimary Level
  - 16.0504 Food Service Supervisor
  - 16.0505 Interior Decorator Assistant
  - 16.0506 Home Equipment Demonstrator
  - 16.0599 Home-Economics Related Technology, Other

* MISCELLANEOUS TECHNICAL EDUCATION
  - 16.0601 Commercial Pilot Training
  - 16.0602 Fire and Fire Safety Technology
  - 16.0603 Forestry Technology
  - 16.0604 Oceanographic Technology (Physical, Biological, and Fisheries)

MISCELLANEOUS TECHNICAL EDUCATION, cont'd
  - 16.0605 Police (Law Enforcement and Corrections) Science Technology
  - 16.0699 Miscellaneous Technical Education, Other

* TECHNICAL EDUCATION, OTHER
  - 16.9900 Technical Education, Other
  - 16.9901 Air Pollution Technology
  - 16.9902 Water & Waste Water Technology

TRADE AND INDUSTRIAL OCCUPATIONS

* AIR CONDITIONING
  - 17.0101 Cooling
  - 17.0102 Heating
  - 17.0103 Ventilating (Filtering and Humidification)
  - 17.0199 Air Conditioning, Other

* APPLIANCE REPAIR
  - 17.0201 Electrical Appliances
  - 17.0202 Gas Appliances

* AUTOMOTIVE SERVICES
  - 17.0301 Body and Fender
  - 17.0302 Mechanics
  - 17.0303 Specialization, Other
  - 17.0399 Automotive Services, Other

* AVIATION OCCUPATIONS
  - 17.0401 Aircraft Maintenance
  - 17.0402 Aircraft Operations
  - 17.0403 Ground Operations
  - 17.0499 Aviation Occupations, Other

* BLUEPRINT READING
  - 17.0500 Blueprint Reading

* BUSINESS MACHINE MAINTENANCE
  17.0600 Business Machine Maintenance

* COMMERCIAL ART OCCUPATIONS
  17.0701 Interior Decorating
  17.0702 Window Display
  17.0703 Product Design
  17.0799 Commercial Art Occupations, Other

* COMMERCIAL FISHERY OCCUPATIONS
  17.0801 Seamanship
  17.0802 Ship and Boat Operation and Maintenance
  17.0899 Commercial Fishery Occupations, Other

* COMMERCIAL PHOTOGRAPHY OCCUPATIONS
  17.0901 Photographic Laboratory and Darkroom Occupations
  17.0999 Commercial Photography Occupations, Others.

* CONSTRUCTION AND MAINTENANCE TRADES
  17.1001 Carpentry
  17.1002 Electricity
  17.1003 Heavy Equipment (Construction
  17.1004 Masonry
  17.1005 Painting and Decorating
  17.1006 Plastering
  17.1007 Plumbing and Pipefitting
  17.1008 Dry-Wall Installation
  17.1009 Glazing
  17.1010 Roofing
  17.1099 Construction and Maintenance Trades, Other

* CUSTODIAL SERVICES
  17.1100 Custodial Services

* DIESEL MECHANIC
  17.1200 Diesel Mechanic

* DRAFTING
  17.1300 Drafting

* ELECTRICAL OCCUPATIONS
  17.1401 Industrial Electrician
  17.1402 Lineman
  17.1403 Motor Repairman
  17.1499 Electrical Occupations, Other

* ELECTRONICS OCCUPATIONS
  17.1501 Communications
  17.1502 Industrial Electronics
  17.1503 Radio/Television
  17.1599 Electronics Occupations, Other

* FABRIC MAINTENANCE SERVICES
  17.1601 Drycleaning
  17.1602 Laundering
  17.1699 Fabric Maintenance Services, Other

* FOREMANSHIP, SUPERVISION AND MANAGEMENT DEVELOPMENT
  17.1700 Foremanship, Supervision and Management Development

* GENERAL CONTINUATION
  17.1800 General Continuation

* GRAPHIC ARTS OCCUPATIONS
  17.1901 Composition, Makeup, and Typesetting
  17.1902 Printing Press Occupations
  17.1903 Lithography, Photography, and Platemaking
  17.1904 Photoengraving
  17.1905 Silk Screen Making and Printing
  17.1906 Bookbinding
  17.1999 Graphic Arts, Other

* INDUSTRIAL ATOMIC ENERGY
  - 17.2001 Installation, Operation, and Maintenance of Reactors
  - 17.2002 Radiography
  - 17.2003 Industrial Uses of Radiosotopes
  - 17.2099 Industrial Atomic Energy, Other

* INSTRUMENT MAINTENANCE AND REPAIR
  - 17.2101 Instruments (Other than Watches and Clocks)
  - 17.2102 Watchmaking and Repair

* MARITIME OCCUPATIONS
  - 17.2200 Maritime Occupations

* METALWORKING
  - 17.2301 Foundry
  - 17.2302 Machine Shop
  - 17.2303 Machine Tool Operation
  - 17.2304 Metal Trades, Combined
  - 17.2305 Sheet Metal
  - 17.2306 Welding and Cutting
  - 17.2307 Tool and Die Making
  - 17.2308 Die Sinking
  - 17.2309 Metal Patternmaking
  - 17.2399 Metalworking, Other

* METALLURGY
  - 17.2400 Metallurgy

* PERSONAL SERVICES
  - 17.2601 Barbering
  - 17.2602 Cosmetology
  - 17.2699 Personal Services, Other

* PLASTICS OCCUPATIONS
  - 17.2700 Plastics Occupations

* PUBLIC SERVICE OCCUPATIONS
  - 17.2801 Fireman Training
  - 17.2802 Law Enforcement Training
  - 17.2899 Public Service Occupations, Other

* QUANTITY FOOD OCCUPATIONS
  - 17.2901 Baker
  - 17.2902 Cook/Chef
  - 17.2903 Meat Cutter
  - 17.2904 Waiter/Waitress
  - 17.2999 Quantity Food Occupations, Other

* REFRIGERATION
  - 17.3000 Refrigeration

* SMALL ENGINE REPAIR, INTERNAL COMBUSTION
  - 17.3100 Small Engine Repair, Internal Combustion

* STATIONARY ENERGY SOURCES OCCUPATIONS
  - 17.3201 Electric Power Generating Plants
  - 17.3202 Pumping Plants
  - 17.3299 Stationary Energy Sources Occupations, Other

* TEXTILE PRODUCTION AND FABRICATION
  - 17.3301 Dressmaking
  - 17.3302 Tailoring
  - 17.3399 Textile Production and Fabrication, Other

* LEATHERWORKING
  - 17.3401 Shoe Manufacturing
  - 17.3402 Shoe Repair
  - 17.3499 Leatherworking, Other

* UPHOLSTERING
  - 17.3500 Upholstering

* WOODWORKING
  17.3601 Millwork and Cabinet Making
  17.3699 Woodworking, Other

* TRADE AND INDUSTRIAL OCCUPATION, OTHER
  17.9900 Trade and Industrial Occupation, Other

SPECIAL PROGRAMS

99.0100 Group Guidance (prevocational)
99.0200 Prepostsecondary
99.0300 Remedial (Vocational Improvement Program)
99.0400 Other N.E.C.

APPENDIX C

Personnel / Enrollment Data -- Building & Site/Cost and Size

I. Name of School: _____ , _____
(district)

II. Total Number of Teachers:

Elementary . . . . . _____

Secondary . . . . . _____

System Total . . . . . _____

System Voc.-Tech. Ed. Teachers . . . . . _____

Total Teachers _____ . . . . . _____
(specific school)

Voc.-Tech. Ed.* _____ . . . . . _____
(specific school)

III. Total Student Enrollment: **

Elementary . . . . . _____

Secondary . . . . . _____

System Total . . . . . _____

System wide Voc.-Tech. Ed. Enrollment . . . . . _____

Total Enrollment _____ . . . . . _____
(specific school)

Voc.-Tech. Ed. Enrollment* _____ . . . _____
(specific school)

IV. Building and Site: Cost, Size

A. Initial total cost of:

Central Office Building . . . . . $_____

Central Office Site . . . . . $_____

Building _____ . . . . . $_____
(specific school)

Site _____ . . . . . $_____
(specific school)

B. Size of:

Central Office Building . . . . . _____(sq. ft.)

Central Office Site . . . . . _____(acres)

Building _____ . . . . . _____(sq. ft.)
(specific school)

Site _____ . . . . . _____(acres)
(specific school)

V. Equipment: (not included in capital outlay)

Initial total cost of:

All Central Office Equipment (insurance). . $_____

Voc.-Tech. Equipment at Central Office. . . $_____

All Equipment _____ . . . . . $_____
(specific school)
(non-classroom) (insurance)

*Can be obtained at building level (Form- BL. 02)

**Figures from November AIM 1972

BUILDING LEVEL DATA FORM: OPERATIONS

_____ (school district) _____ (school building)

Total number students enrolled in Voc.-Tech. Ed. (B.L.) _____

Total number teachers in Voc.-Tech. Ed. (B.L.) _____

Voc.-Tech. Ed. programs in operation (B.L.):

(Course)	No. Teachers	No. Pupils	Time Span-HR	Sq. Ft.	Equip. Cost
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

Course _____ School _____

TEACHER'S SALARIES

NAME	% COURSE	% TIME	ANNUAL SALARY

Course _____ School _____

EQUIPMENT COST (B. L.)

Quantity	Model	Item	Life Span	Unit Cost	Cost

VOCATIONAL COST ANALYSIS BREAKOUT CHART

_____

SCHOOL DISTRICT

SECTION I

ADMINISTRATION (2100) -- OPERATION OF PLANT (2600)

	DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL					
ADMINISTRATION (2100 series)									
2110 Salaries for Administration									
2110.1 Board of Education									
2110.2 Secretary to Board of Educ.									
2110.3 Superintendent of Schools									
2110.4 Personnel Assist. Sup. in Ad.									
2110.5 Purchasing Office									
2110.6 Accounting Personnel									
2110.7 Salaries of Clerks in Admin.									
2110.9 Other Salaries for Admin.									
2120 Contracted Services for Admin.									
2120.1 Co. Trustee's Comm. Deducted									
2120.2 Travel Expenses of Admin. Per.									
2120.8 Telephone & Telegraph									
2120.9 Other Contracted Services									
2130 Supplies for Administration									

	DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL					
2130.1 Office Supplies & Stationery									
2130.2 Data Processing Supplies									
2130.9 Other Supplies for Admin.									
2190 Other Expenditures for Admin.									
2190.9 Miscell. Admin. Expenses									
2100 TOTAL EXPENDITURES FOR ADMIN.									
INSTRUCTIONS (2200 series)									
2210 Salaries for Instruction									
2210.1 Principals									
2210.2 Consultants or Supervisors									
2210.3 Teachers									
2210.31 Regular Teachers									
2210.32 Subitute Teachers									
2210.4 Other Instructional Staff									
2210.41 Materials Clerk									
2210.42 Audio Visual Personnel									

	DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL					
2210.43 Guidance Personnel									
2210.44 Psychological Personnel									
2210.45 T.V. Instruction Personnel									
2210.5 Secretarial & Clerical Assist.									
2210.5. Principal's Office									
2210.52 Consultants or Supervisors									
2210.53 Teachers									
2210.54 Other Clerical Assistants									
2210.9 Other Salaries for Instruct.									
2220 Contracted Services									
2220.1 Travel Expense of Instruct.Per.									
2220.11 Travel Expenses for System-Wide Teachers									
2220.12 Travel Expenses for Home-Bound Teachers									
2220.13 Travel Expenses for Vocational Teachers									
2220.19 Travel Expenses for Other Instruct. Personnel									
2220.2 Consultants Fees									

	DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL					
2220.9 Instruction-Other Contracted services									
2230 Supplies for Instruction									
2230.1 Teaching Supplies									
2230.9 Other Supplies for Instruct.									
2241 Textbooks									
2241.1 Textbooks Purchased									
2241.2 Bind. & Repair of Textbooks									
2242 School Lib. & A.V. Materials									
2242.1 School Library Books									
2242.2 Periodicals & Newspapers									
2242.3 Audio-Visual Materials									
2242.9 Other School Lib. Expenses									
2243.1 TitleIII Materials (NDEA)									
2243.2 Title V Materials (NDEA)									
2243.9 Other Materials for Instruct.									
2290 Other Expenses for Instruct.									

	DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL					
2290.9 Miscell. Instructional Expen.									
2200 TOTAL EXPENDITURES FOR INSTRUCT.									
ATTENDANCE SERVICES (2300 series)									
2310 Salaries for Attend. services									
2310.1 Attendance Personnel									
2310.9 Other Salaries for Attendance Services									
2320 Contracted Services									
2320.1 Travel Expenses of Attendance Personnel									
2320.9 Other Contracted Services									
2330 Supplies									
2330.1 Office Supplies & forms									
2330.2 Supplies for Operation of Vehicles & Equipment									
2390 Othe Expenditures for Attendance Services									
2390.9 Miscell. Expen. for Att. Serv.									
2300 TOTAL EXPEND. FOR ATTEND. SERVICE									

	DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL					
HEALTH SERVICES (2400 series)									
2410 Salaries for Health Services									
2410.1 Prof. & Tech. Health Personl.									
2410.2 Non-Prof. Health Personnel									
2420 Contracted Services									
2420.1 Travel Expens. Health Service									
2420.9 Other Contracted Services									
2430 Supplies for Health Services									
2430.1 Medical & Surgical Supplies									
2430.9 Other Supplies for Health Ser.									
2440 Materials for Health Service									
2490 Other Expend. for Health Ser.									
2490.9 Miscell. Health Ser. Expenses									
2400 TOTAL EXPEND. FOR HEALTH SERVICE									

	DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL					
PUPIL TRANSPROTATION SERVICES (2500 series)									
2510 Salaries for Pupil Transport.									
2510.1 Supervisors									
2510.2 Bus Drivers									
2510.3 Mechanics & Other Garage Employees									
2510.4 Clerks & Other Employees									
2520 Contracted Services & Public Carriers									
2520.1 Contracts with Vehicle Owners for Pupil Transport.									
2520.2 Contracts with Public Carriers for Pupil Transport.									
2520.3 Repair & Maintenance of Vehicles by Private Garages									
2520.4 Repairs to Garage & Gargae Equip.-outside Agencies									
2520.5 Utilities									
2520.8 Telephone & Telegraph									
2530 Supplies for Operation & Maintenance									
2530.1 Gasolines & lubricants									
2530.2 Tires & Tubes									

	DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL					
2530.3 Repair Parts for Vehicles									
2530.4 Repair Parts for Garage Equipr									
2530.5 Supplies for Garage Equipment									
2530.9 Other Supplies for Operation & Maintenance									
2550 Fixed Charges for Pupil Trans.									
2550.1 Rent									
2550.2 Insurance on Vehicles									
2550.3 Ins. on Build. & Equipment									
2550.4 Liability Insurance									
2580 Replacement of Fixed Assets for Pupil Transport.									
2580.1 Replacement of Vehicles									
2580.2 Replacement of Garage Equipt.									
2590 Other Expenses for Pupil Transportation Services									
2590.9 Miscell. Expens. for Pup. Trans.									
2500 TOTAL EXPENS. FOR PUP. TRANSPORT.									

	DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL					
OPERATION OF PLANT (2600 series)									
2610 Salaries for Operation Plant									
2610.1 Plant Engineers									
2610.2 Custodial Services									
2610.3 Care of Grounds									
2610.9 Other Salaries for Plant Operation									
2620 Contracted Services for Plant Operation									
2620.1 (except Heat for) Utilities (Building)									
2620.11 Water & Sewerage Charges									
2620.12 Electric Light & Power									
2620.8 Telephone & Telegraph									
2620.9 Other Contracted Services for Plant Operation									
2630 Supplies for Plant Operation									
2630.1 Heat for Building									
2630.2 Custodial Supplies									
2630.3 Supplies for Operation of Vehicles									

VOCATIONAL COST ANALYSIS BREAKOUT CHART

_____

SCHOOL DISTRICT

SECTION II

MAINTENANCE OF PLANT (2700) -- CLEARING ACCOUNTS (4100)

	DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL					
2630.4 Supplies for Care of Grounds									
2630.9 Other Supplies for Plant Operation									
2690 Other Expenses for Operation of Plant									
2690.9 Miscell. Expen. for Op. of Pl.									
2600 TOTAL EXPEND. FOR OPER.OF PLANT.									
MAINTENANCE OF PLANT (2700 series)									
2710 Salaries of Main. of Plant									
2710.1 Salaries for Upkeep of Ground									
2710.2 Salaries for Repair of Bldg.									
2710.3 Salaries for Repair of Eqipt.									
2710.4 Salaries for Plant Supervisor									
2720 Contracted Services for Maintenance of Plant									
2720.1 Grounds									
2720.2 Buildings									
2720.3 Repair of Equipment									
2720.8 Telephone & Telegraph									

	DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL					
2730 Supplies for the Maintenance of Plant									
2740 Materials & Repair Parts for Palnt Maintenance									
2780 Replacement of Equipment									
2780.1 Replacement of Instructional Equipment									
2780.2 Replacement of Non-Instructional Equipment									
2790 Other Expenses for Plant Maintenance									
2700 TOTAL EXPEND. FOR MAINT. PLANT									
FIXED CHARGES (2800 series)									
2851 Contributions to Employee Retirement									
2851.1 Contributions to Local Retirement Funds									
2851.2 Society Security Charges									
2851.21 Contributions to Social Security System									
2851.22 Social Security Handling Charges									
2851.3 Pension Payments									
2851.4 Contribution to State Retirement Fund									
2852 Insurance on bldg. & Equipment									

	DISTRICT LEVEL	VOCATIONAL EDUCATIONAL DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL					
2852.1 Insurance on Buildings									
2852.2 Insurance on Building Contents & Equipment									
2852.3 Liability Insurance									
2852.4 Workman's Compensation Ins.									
2852.5 Boiler Insurance									
2853 Premium on Fidelity Bonds									
2854 Judgements									
2855 Rentals on Land & Bldgs.									
2856 Interest on Revenue-Anticipation Notes									
2859 Other Fixed Charges									
2800 TOTAL FIXED CHARGES									
FOOD SERVICES (2900 series)									
2910 Salaries for Food Services (not reimbursed)									
2910.1 Salary of Supervisor									
2910.9 Other salaries for Food Services									
2920 (not reimbursed) Contracted Services									

	DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL					
2920.1 Travel of Supervisor									
2920.2 Hauling Commidies									
2920.9 Other Contracted Services									
2930 (not reimbursed) Supplies for Food Services									
2930.1 Fuel for Cooking									
2930.9 Other Supplies for Food Services									
2990 (not reimbursed) Other Food Ser. Expenses									
2900 (not reimbursed) TOTAL EXPEND. FOR FOOD SERVICES									
STUDENT-BODY ACTIVITIES (3000 series)									
3010 Salaries for S.-B. Activities									
3020 Contracted Services									
3030 Supplies									
3040 Materials									
3050 Fixed Charges									
3090 Other Expend. for Student Body Activities									
3000 TOTAL EXPEND. FOR S.-B. ACT.									

	DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL					
COMMUNITY SERVICES (3100 series)									
3110 Salaries for Community Services									
3120 Contracted Services									
3130 Supplies									
3140 Materials									
3150 Fixed Charges									
3170 Capital Outlay									
3180 Replacement of Fixed Assets									
3190 Other Expenses of Community Services									
3100 TOTAL EXPEND. FOR COMM. SERVICES									
CAPITAL OUTLAY (3200 series)									
3271 Sites									
3271.1 Profess. Services for Sites									
3271.2 Site Acquisition									
3271.3 Site Development									
3272 Buildings									

	DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL					
3272.1 Professional Services for Buildings									
3272.2 New Buildings & Building Additions									
3272.3 Remodeling of Buildings									
3272.4 Renovation of Buildings									
3273 Equipment									
3273.1 Professional Services for Equipment									
3273.2 Equipment for Administration									
3273.3 Equipment for Instruction									
3273.31 Regular Instruction Equipt.									
3273.32 Title III Equipt. (NDEA)									
3273.33 Title V Equipt. (NDEA)									
3273.34 Technical Education Program Equipment									
3273.4 Equipt. for Attendance & Health Services									
3273.5 Equipt. for Pupil Transportation									
3273.6 Equipment for Operation of Plant									
3273.7 Equipt. for the Maintenance of Plant									

	DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL					
3273.8 Equipt. for Food Service and Student-Body Activities									
3273.9 Other Equipment									
3274 Profess. Ser. for Sale of Bnd.									
3200 TOTAL EXPEND. FOR CAPT. OUTLAY									
DEBT SERVICE FROM CURRENT FUNDS (3300 series)									
3361 Principal on Debt									
3361.1 Principal on Bonds									
3361.2 Principal on Long-Term Notes									
3362 Interest on Debt									
3362.1 Interest on Bonds									
3362.2 Interest on Long-Term Notes									
3363 Amts. Pd. into sinking Funds for Bonds & Interest									
3369 Other Debt Service from Current Funds									
3369.1 Bank Service Charges									
3300 TOTAL DEBT SER. FM. CURRENT FUNDS									

	DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL					
OUTGOING TRANSFER ACCOUNTS (3400 series)									
3491 expenditures to other School Systems in Tenn.									
3491.1 Tuition									
3491.2 Transportation									
3491.9 Miscellaneous									
3492 Expenditures to other School Systems in other States									
3492.1 Tuition									
3492.2 Transportation									
3492.9 Miscellaneous									
3499 Tuition to other than Pub.Sch.									
3400 TOTAL OUTGOING TRANSFER ACCTS.									
ADULT EDUCATION (3500 series)									
3510 Salaries for Adult Educ.									
3520 Contracted services for Adult Education									
3530 Supplies for Adult Educ.									
3540 Materials for Adult Educ.									

	DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL					
3550 Fixed Charges for Adult Education									
3570 Capital outlay Expenses for Adult Education									
3590 Other Expenses for Adult Ed.									
3500 TOTAL EXPEND. FOR ADULT EDUC.									
81 TOTAL EXPENDITURES									
CLEARING ACCOUNTS (3600-4100 series)									
3600 Current Loans-Tax Anticipation Notes									
3700 Food Service Program									
3710 Salaries from Cafeterias									
3750 Social Security from Cafeterias									
3751 Witholding from Cafeterias									
3752 Transportation Funds from School Cafeterias									
3800 Milk Program									
3900 Study Body Activities									
3920 Material for Resale									
4000 Insurance Adjustments									

| | DISTRICT LEVEL | VOCATIONAL EDUCATION DISTRICT LEVEL | BUILDING LEVEL | VOCATIONAL EDUCATION BUILDING LEVEL | | |

APPENDIX D

ALTERED FORMAT FOR PREPARATION OF COMPUTER ANALYSIS

The original instrumentation used to collect data within the sample schools was revised to expedite computer analysis. The revisions involved three basic steps:

1. Preparation of a fact sheet which supplied information to the computer programmer relative to student enrollment figures pertinent to the proration of expenditures as they were recorded in the appropriate columns (district level, vocational education district level, building level and vocational education building level).

   The fact sheet further supplied expenditures relative to building costs, site costs and equipment costs that were not directly related to vocational-technical education but were considered as system wide expenditures effecting the delivery cost of vocational-technical education. At this point it should be noted that the total building costs (school and central offices) were obtained and depreciated using a straight line formula based on a 50 year life. The value and size of the central office site and the site on which the selected sample school was located were also collected.[3]

   All equipment costs were obtained from original purchase orders when possible, or from estimates made by course instructors, program

---

[3]The cost of the site was derived from estimates based on current market value. The proportion of the site costs applicable to the delivery cost of a vocational-technical course or category was derived by applying a six percent interest rate to that market value.

directors and business managers. The equipment was depreciated using a straight line formula applied to the estimated life of the equipment as provided by the course instructor. (No consideration was given to the salvage value of equipment.)

2. The second modification of the original instrument was the development of a program category and course breakout chart. The utilization of this chart provided the programmer with all pertinent data relative to direct costs per program category or course. The course contact hours per year were derived by multiplying 175 school days by the number of hours the course met per day.

   The square footage column indicates the amount of space utilized in the delivery of a program course or category. A proportional share of the cost of this square footage was obtained by establishing a cost per square foot. This cost per square foot was then multiplied by the total number of square feet required for the delivery of each program course or category.

3. The final format modification provided a consolidation of line item budget expenditures into indirect category costs. To provide useful data for computer analysis each line item expenditure was assigned to one of twelve indirect cost categories. Further interpretation of these expenditures is found in Appendix A.

_____ (SCHOOL) _____ (NO.)

I. Total Student Enrollment:

System Total. . . . . _____

System wide Voc.-Tech. Ed. Enrollment . . . . . _____

Total Enrollment _____ (specific school) . . . . . _____

Voc.-Tech. Ed. Enrollment _____ (school) . . . . . _____

II. Building and Site: Cost, Size

A. Initial total cost of:

Central Office Building . . . . . $_____

Central Office Site . . . . . $_____

Building _____ (specific school) . . . . . $_____

Site _____ . . . . . $_____

B. Size of:

Central Office Building . . . . . _____ (sq. ft.)

Central Office Site . . . . . _____ (acres)

Building _____ (specific school) . . . . . _____ (sq. ft.)

Site _____ (specific school) . . . . . _____ (acres)

III. Equipment: (not included in capital outlay)

Initial total cost of:

All Central Office Equipment (insurance). . . . $_____

Voc.-Tech. Equipment at Central Office . . . . $_____

All Equipment _____ (specific school) . . . . . $_____

(non-classroom) (insurance)

COST ANALYSIS OF VOCATIONAL-TECHNICAL EDUCATION

PROGRAM ELEMENT BREAKOUT CHART

FOR

_____ _____
(school number) (school)

Course Number	Course Title	Contact Hr. per year *	Annual Supplies	Equipment Costs	Life Span Equipment	Annual Salaries	% Time (Teachers)	No. Pupils	Square Footage

VOCATIONAL COST ANALYSIS BREAKOUT CHART

_____

SCHOOL DISTRICT

SECTION I

ADMINISTRATION (2100) -- OPERATION OF PLANT (2600)

		DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL				
	ADMINISTRATION (2100 series)								
	2110 Salaries for Administration								
001	2110.1 Board of Education								
001	2110.2 Secretary to Board of Educ.								
002	2110.3 Superintendent of Schools								
002	2110.4 Personnel Assist. Sup. in Ad.								
	2110.5 Purchasing Office								
002	2110.6 Accounting Personnel								
002	2110.7 Salaries of Clerks in Admin.								
002	2110.9 Other Salaries for Admin.								
005	2120 Contracted Services for Admin.								
005	2120.1 Co. Trustee's Comm. Deducted								
005	2120.2 Travel Expenses of Admin. Per.								
007	2120.8 Telephone & Telegraph								
005	2120.9 Other Contracted Services								
003	2130 Supplies for Administration								

		DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL				
003	2130.1 Office Supplies & Stationery								
003	2130.2 Data Processing Supplies								
003	2130.9 Other Supplies for Admin.								
003	2190 Other Expenditures for Admin.								
003	2190.9 Miscell. Admin. Expenses								
	2100 TOTAL EXPENDITURES FOR ADMIN.								
	INSTRUCTIONS (2200 series)								
002	2210 Salaries for Instruction								
002	2210.1 Principals								
002	2210.2 Consultants or Supervisors								
	2210.3 Teachers								
	2210.31 Regular Teachers								
002	2210.32 Subitute Teachers								
002	2210.4 Other Instructional Staff								
002	2210.41 Materials Clerk								
002	2210.42 Audio Visual Personnel								

		DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL				
002	2210.43 Guidance Personnel								
002	2210.44 Psychological Personnel								
002	2210.45 T.V. Instruction Personnel								
002	2210.5 Secretarial & Clerical Assist.								
002	2210.5. Principal's Office								
002	2210.52 Consultants or Supervisors								
002	2210.53 Teachers								
002	2210.54 Other Clerical Assistants								
002	2210.9 Other Salaries for Instruct.								
005	2220 Contracted Services								
005	2220.1 Travel Expense of Instruct.Per.								
005	2220.11 Travel Expenses for System-Wide Teachers								
005	2220.12 Travel Expenses for Home-Bound Teachers								
005	2220.13 Travel Expenses for Vocational Teachers								
005	2220.19 Travel Expenses for Other Instruct. Personnel								
005	2220.2 Consultants Fees								

		DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL				
005	2220.9 Instruction-Other Contracted services								
	2230 Supplies for Instruction								
	2230.1 Teaching Supplies								
	2230.9 Other Supplies for Instruct.								
004	2241 Textbooks								
004	2241.1 Textbooks Purchased								
004	2241.2 Bind. & Repair of Textbooks								
004	2242 School Lib. & A.V. Materials								
004	2242.1 School Library Books								
004	2242.2 Periodicals & Newspapers								
004	2242.3 Audio-Visual Materials								
004	2242.9 Other School Lib. Expenses								
	2243.1 ~~Title III Materials (NDEA)~~								
	2243.2 ~~Title V Materials (NDEA)~~								
004	2243.9 Other Materials for Instruct.								
004	2290 Other Expenses for Instruct.								

		DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL				
004	2290.9 Miscell. Instructional Expen.								
	2200 TOTAL EXPENDITURES FOR INSTRUCT.								
	ATTENDANCE SERVICES (2300 series)								
002	2310 Salaries for Attend. services								
002	2310.1 Attendance Personnel								
002	2310.9 Other Salaries for Attendance Services								
005	2320 Contracted Services								
005	2320.1 Travel Expenses of Attendance Personnel								
005	2320.9 Other Contracted Services								
006	2330 Supplies								
006	2330.1 Office Supplies & forms								
006	2330.2 Supplies for Operation of Vehicles & Equipment								
006	2390 Othe Expenditures for Attendance Services								
006	2390.9 Miscell. Expen. for Att. Serv.								
	2300 TOTAL EXPEND. FOR ATTEND. SERVICE								

		DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL				
	HEALTH SERVICES (2400 series)								
002	2410 Salaries for Health Services								
002	2410.1 Prof. & Tech. Health Personl.								
002	2410.2 Non-Prof. Health Personnel								
005	2420 Contracted Services								
005	2420.1 Travel Expens. Health Service								
005006	2420.9 Other Contracted Services								
006	2430 Supplies for Health Services								
006	2430.1 Medical & Surgical Supplies								
006	2430.9 Other Supplies for Health Ser.								
006	2440 Materials for Health Service								
006	2490 Other Expend. for Health Ser.								
006	2490.9 Miscell. Health Ser. Expenses								
	2400 TOTAL EXPEND. FOR HEALTH SERVICE								

		DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL				
	PUPIL TRANSPROTATION SERVICES (2500 series)								
002	2510 Salaries for Pupil Transport.								
002	2510.1 Supervisors								
002	2510.2 Bus Drivers								
002	2510.3 Mechanics & Other Garage Employees								
002	2510.4 Clerks & Other Employees								
005	2520 Contracted Services & Public Carriers								
005	2520.1 Contracts with Vehicle Owners for Pupil Transport.								
005	2520.2 Contracts with Public Carriers for Pupil Transport.								
006	2520.3 Repair & Maintenance of Vehicles by Private Garages								
006	2520.4 Repairs to Garage & Gargae Equip.-outside Agencies								
007	2520.5 Utilities								
007	2520.8 Telephone & Telegraph								
006	2530 Supplies for Operation & Maintenance								
006	2530.1 Gasolines & lubricants								
006	2530.2 Tires & Tubes								

		DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL				
006	2530.3 Repair Parts for Vehicles								
006	2530.4 Repair Parts for Garage Equip								
006	2530.5 Supplies for Garage Equipment								
006	2530.9 Other Supplies for Operation & Maintenance								
009	2550 Fixed Charges for Pupil Trans.								
009	2550.1 Rent								
009	2550.2 Insurance on Vehicles								
009	2550.3 Ins. on Build. & Equipment								
009	2550.4 Liability Insurance								
011	2580 Replacement of Fixed Assets for Pupil Transport.								
011	2580.1 Replacement of Vehicles								
011	2580.2 Replacement of Garage Equipt.								
006	2590 Other Expenses for Pupil Transportation Services								
006	2590.9 Miscell. Expens. for Pup. Trans.								
	2500 TOTAL EXPENS. FOR PUP. TRANSPORT.								

		DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL				
	OPERATION OF PLANT (2600 series)								
002	2610 Salaries for Operation Plant								
002	2610.1 Plant Engineers								
002	2610.2 Custodial Services								
002	2610.3 Care of Grounds								
002	2610.9 Other Salaries for Plant Operation								
007	2620 Contracted Services for Plant Operation								
007	2620.1 (except Heat for) Utilities (Building)								
007	2620.11 Water & Sewerage Charges								
007	2620.12 Electric Light & Power								
007	2620.8 Telephone & Telegraph								
006	2620.9 ~~Other-Contracted~~ Services for Plant Operation								
006	2630 Supplies for Plant Operation								
007	2630.1 Heat for Building								
006	2630.2 Custodial Supplies								
006	2630.3 Supplies for Operation of Vehicles								

		DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL				
006	2630.4 Supplies for Care of Grounds								
006	2630.9 Other Supplies for Plant Operation								
006	2690 Other Expenses for Operation of Plant								
006	2690.9 Miscell. Expen. for Op. of Pl.								
	2600 TOTAL EXPEND. FOR OPER.OF PLANT.								
	MAINTENANCE OF PLANT (2700 series)								
002	2710 Salaries of Main. of Plant								
002	2710.1 Salaries for Upkeep of Ground								
002	2710.2 Salaries for Repair of Bldg.								
002	2710.3 Salaries for Repair of Eqipt.								
002	2710.4 Salaries for Plant Supervisor								
008	2720 ~~Contracted Services for~~ Maintenance of Plant								
008	2720.1 Grounds								
008	2720.2 Buildings								
008	2720.3 Repair of Equipment								
007	2720.8 Telephone & Telegraph								

		DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL				
006	2730 Supplies for the Maintenance of Plant								
006	2740 Materials & Repair Parts for Palnt Maintenance								
011	2780 Replacement of Equipment								
011	2780.1 Replacement of Instructional Equipment								
011	2780.2 Replacement of Non-Instructional Equipment								
006	2790 Other Expenses for Plant Maintenance								
	2700 TOTAL EXPEND. FOR MAINT. PLANT								
009	FIXED CHARGES (2800 series)								
009	2851 Contributions to Employee Retirement								
009	2851.1 Contributions to Local Retirement Funds								
009	2851.2 Society Security Charges								
009	2851.21 Contributions to Social Security System								
009	2851.22 Social Security Handling Charges								
009	2851.3 Pension Payments								
009	2851.4 Contribution to Stare Retirement Fund								
009	2852 Insurance on bldg. & Equipment								

		L STRICT LEVEL	VOCATIONAL EDUCATIONAL DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL				
009	2852.1 Insurance on Buildings								
009	2852.2 Insurance on Building Contents & Equipment								
009	2852.3 Liability Insurance								
009	2852.4 Workman's Compensation Ins.								
009	2852.5 Boiler Insurance								
009	2853 Premium on Fidelity Bonds								
009	2854 Judgements								
009	2855 Rentals on Land & Bldgs.								
009	2856 Interest on Revenue-Anticipation Notes								
009	2859 Other Fixed Charges								
	2800 TOTAL FIXED CHARGES								
	FOOD SERVICES (2900 series)								
002	2910 Salaries for Food Services (not reimbursed)								
002	2910.1 Salary of Supervisor								
002	2910.9 Other salaries for Food Services								
005	2920 (not reimbursed) Contracted Services								

		DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL				
005	2920.1 Travel of Supervisor								
005	2920.2 Hauling Commidies								
005	2920.9 Other Contracted Services								
006	2930 (not reimbursed) Supplies for Food Services								
006	2930.1 Fuel for Cooking								
006	2930.9 Other Supplies for Food Services								
006	2990 (not reimbursed) Other Food Ser. Expenses								
	2900 (not reimbursed) TOTAL EXPEND. FOR FOOD SERVICES								
012	STUDENT-BODY ACTIVITIES (3000 series)								
012	3010 Salaries for S.-B. Activities								
012	3020 Contracted Services								
012	3030 Supplies								
012	3040 Materials								
012	3050 Fixed Charges								
012	3090 Other Expend. for Student Body Activities								
	3000 TOTAL EXPEND. FOR S.-B. ACT.								

		DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL				
	COMMUNITY SERVICES (3100 series)								
012	3110 Salaries for Community Services								
012	3120 Contracted Services								
012	3130 Supplies								
012	3140 Materials								
012	3150 Fixed Charges								
012	3170 Capital Outlay								
012	3180 Replacement of Fixed Assets								
012	3190 Other Expenses of Community Services								
	3100 TOTAL EXPEND. FOR COMM. SERVICES								
	CAPITAL OUTLAY (3200 series)								
011	3271 Sites								
011	3271.1 Profess. Services for Sites								
011	3271.2 Site Acquisition								
011	3271.3 Site Development								
011	3272 Buildings								

		DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL					
011	3272.1 Professional Services for Buildings									
011	3272.2 New Buildings & Building Additions									
011	3272.3 Remodeling of Buildings									
011	3272.4 Renovation of Buildings									
011	3273 Equipment									
011	3273.1 Professional Services for Equipment									
011	3273.2 Equipment for Administration									
011	3273.3 Equipment for Instruction									
011	3273.31 Regular Instruction Equipt.									
	3273.32 ~~Title III Equipt. (NDEA)~~									
	3273.33 ~~Title V Equipt. (NDEA)~~									
011	3273.34 Technical Education Program Equipment									
011	3273.4 Equipt. for Attendance & Health Services									
011	3273.5 Equipt. for Pupil Transportation									
011	3273.6 Equipment for Operation of Plant									
011	3273.7 Equipt. for the Maintenance of Plant									

		DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL				
011	3273.8 Equipt. for Food Service and Student-Body Activities								
011	3273.9 Other Equipment								
011	3274 Profess. Ser. for Sale of Bnd.								
	3200 TOTAL EXPEND. FOR CAPT. OUTLAY								
010	DEBT SERVICE FROM CURRENT FUNDS (3300 series)								
010	3361 Principal on Debt								
010	3361.1 Principal on Bonds								
010	3361.2 Principal on Long-Term Notes								
010	3362 Interest on Debt								
010	3362.1 Interest on Bonds								
010	3362.2 Interest on Long-Term Notes								
010	3363 Amts. Pd. into sinking Funds for Bonds & Interest								
010	3369 Other Debt Service from Current Funds								
010	3369.1 Bank Service Charges								
	3300 TOTAL DEBT SER. FM. CURRENT FUNDS								

	DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL				
OUTGOING TRANSFER ACCOUNTS (3400 series)								
3491expenditures to other School Systems in Tenn.								
3491.1 Tuition								
3491.2 Transportation								
3491.9 Miscellaneous								
3492 Expenditures to other School Systems in other States								
3492.1 Tuition								
3492.2 Transportation								
3492.9 Miscellaneous								
3499 Tuition to other than Pub.Sch.								
3400 TOTAL OUTGOING TRANSFER ACCTS.								
ADULT EDUCATION (3500 series)								
3510 Salaries for Adult Educ.								
3520 Contracted services for Adult Education								
3530 Supplies for Adult Educ.								
3540 Materials for Adult Educ.								

		DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL				
	3550 Fixed Charges for Adult Education								
	3570 Capital outlay Expenses for Adult Education								
	3590 Other Expenses for Adult Ed.								
	3500 TOTAL EXPEND. FOR ADULT EDUC.								
	81 TOTAL EXPENDITURES								
	CLEARING ACCOUNTS (3600-4100 series)								
012	3600 Current Loans-Tax Anticipation Notes								
012	3700 Food Service Program								
012	3710 Salaries from Cafeterias								
012	3750 Social Security from Cafeterias								
012	3751 Witholding from Cafeterias								
012	3752 Transportation Funds from School Cafeterias								
012	3800 Milk Program								
012	3900 Study Body Activities								
012	3920 Material for Resale								
012	4000 Insurance Adjustments								

		DISTRICT LEVEL	VOCATIONAL EDUCATION DISTRICT LEVEL	BUILDING LEVEL	VOCATIONAL EDUCATION BUILDING LEVEL				
012	4090 Other Miscellaneous Clearing Accounts (Refunds)								
	4100 ~~Special Adult Educ. Programs~~								
	3600								
	4100 TOTAL CLEARING ACCOUNTS								